

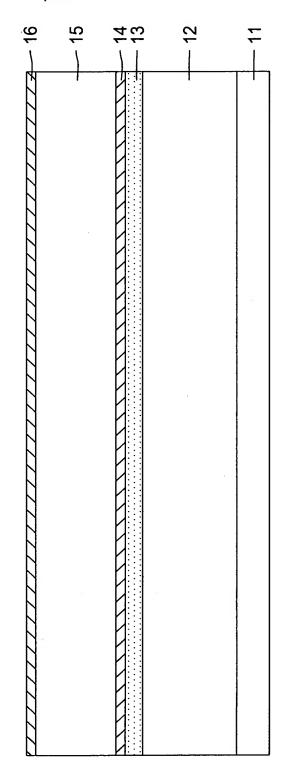
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Isolation	Nitride	AuGe / Au Metal	- TiW / Au / Ti Material	BCB / SOG
Intra Cavity Contact Layer	Active Region	Oxide	Photo Resist	Oxidized Layer

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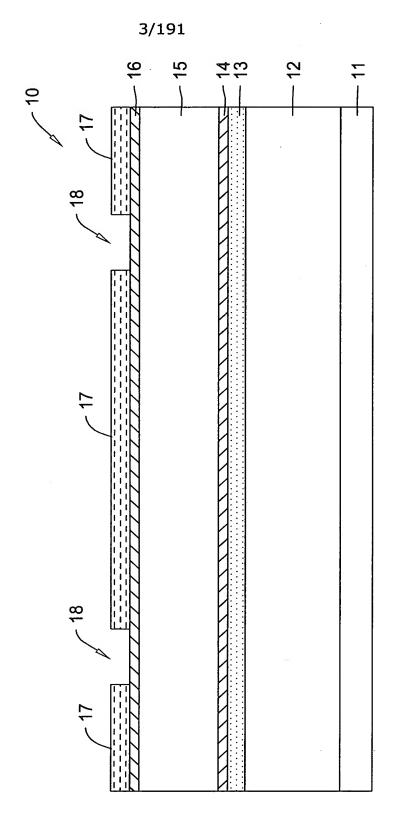
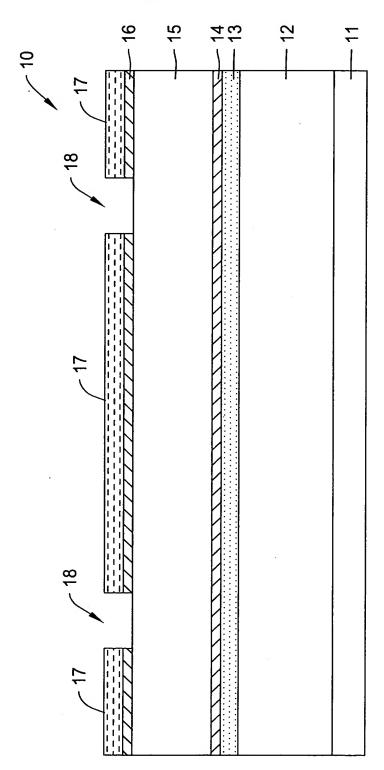


Figure 2A

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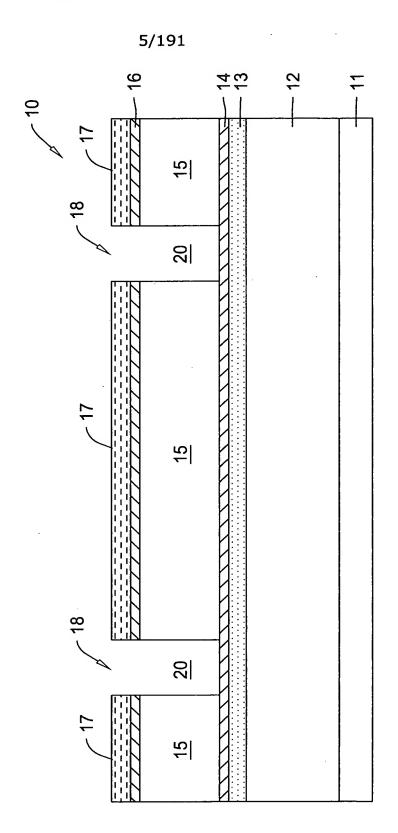
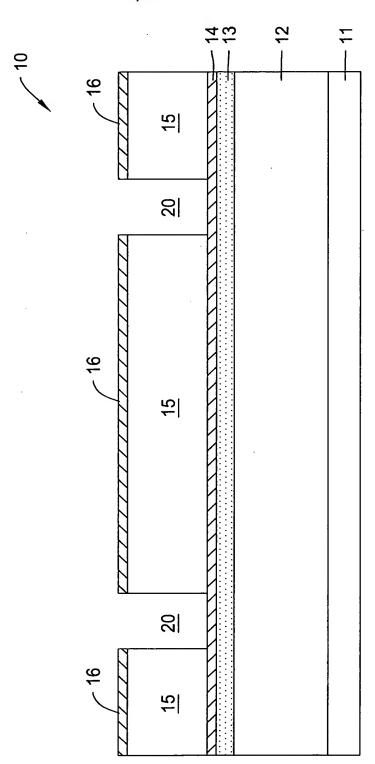


Figure 4

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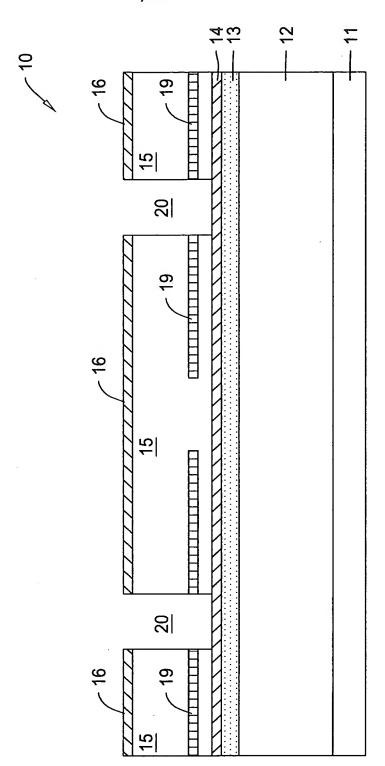
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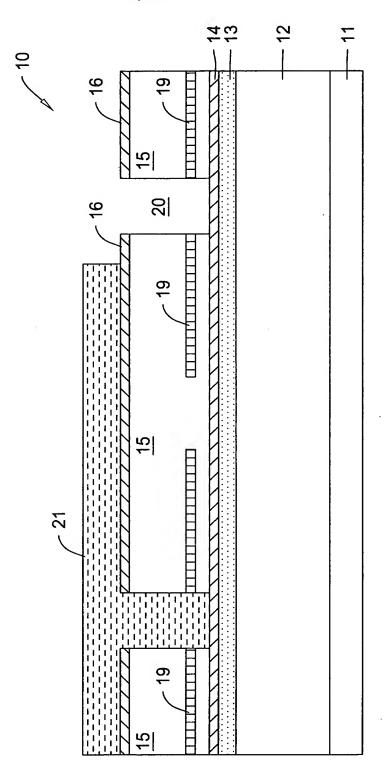
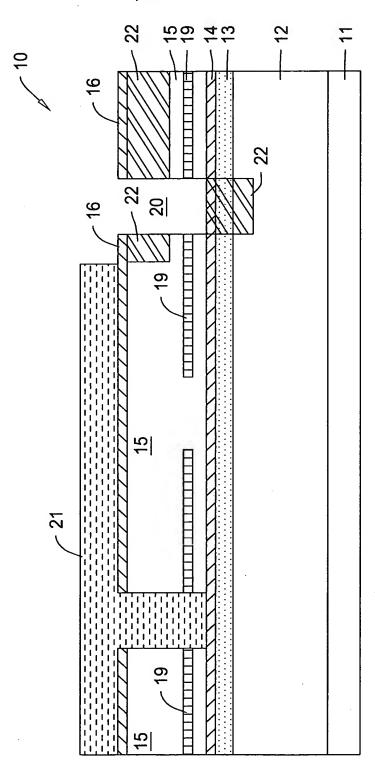


Figure 7

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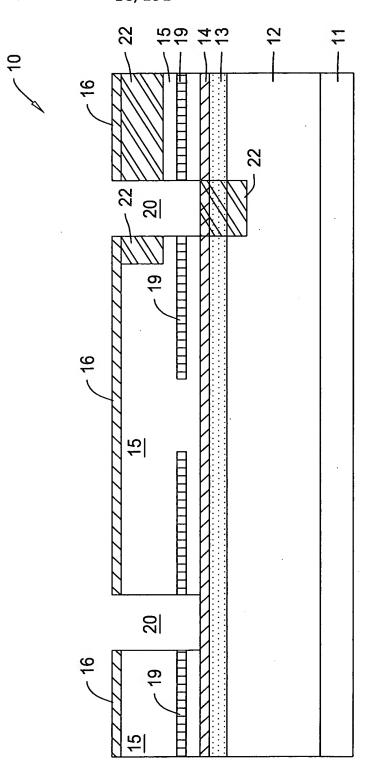
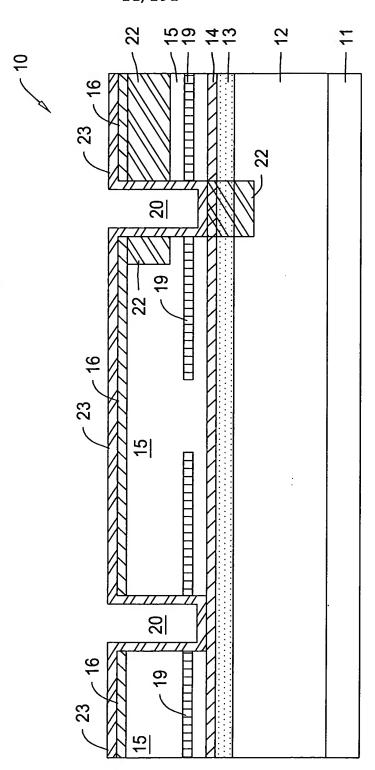


Figure 9

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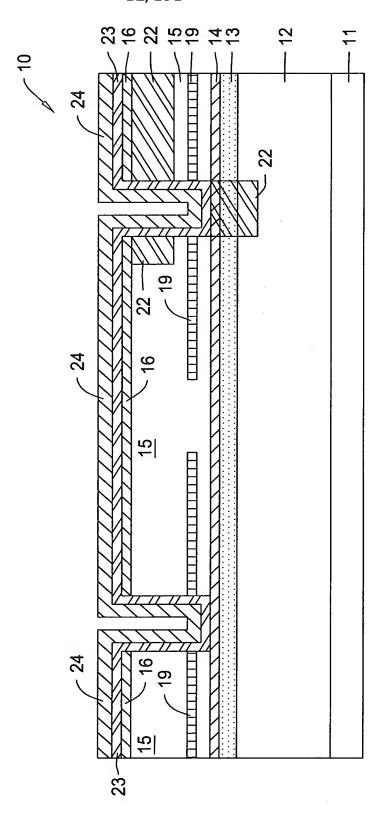
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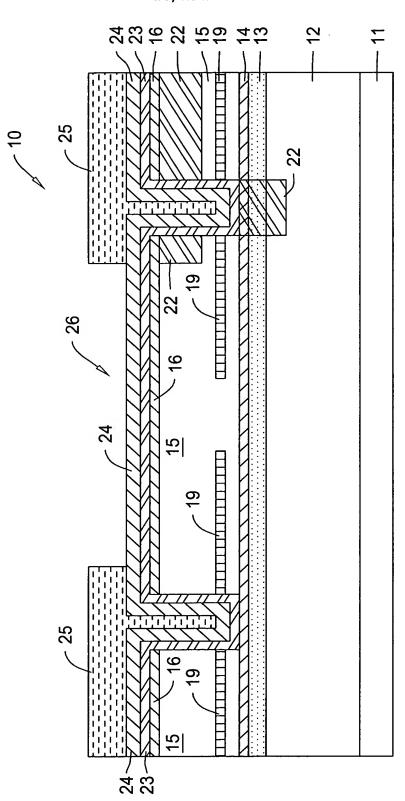
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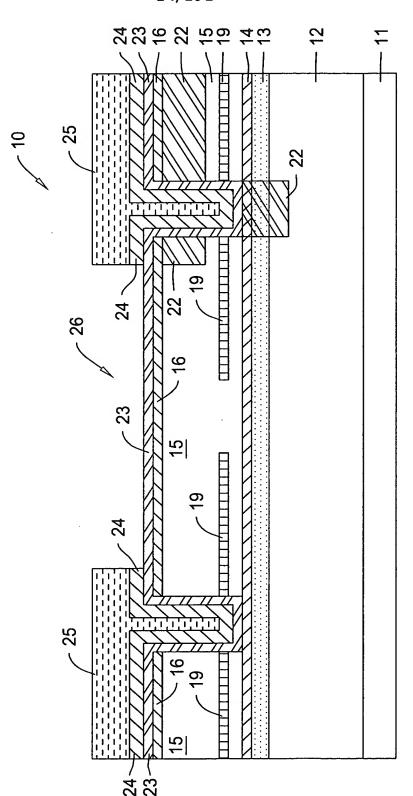


Figure 13

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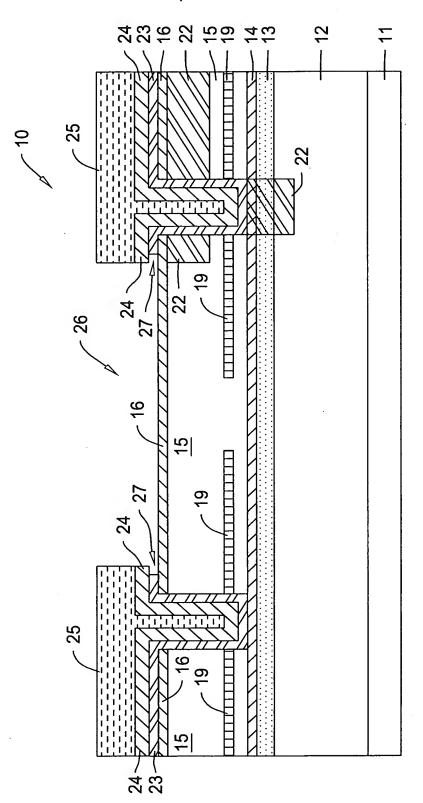


Figure 14

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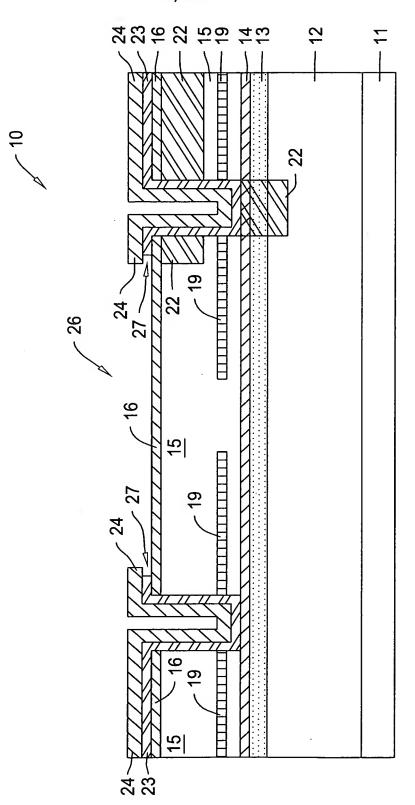
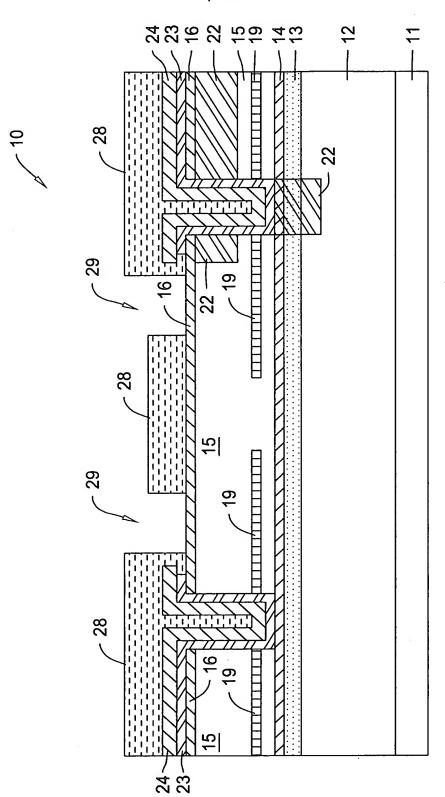


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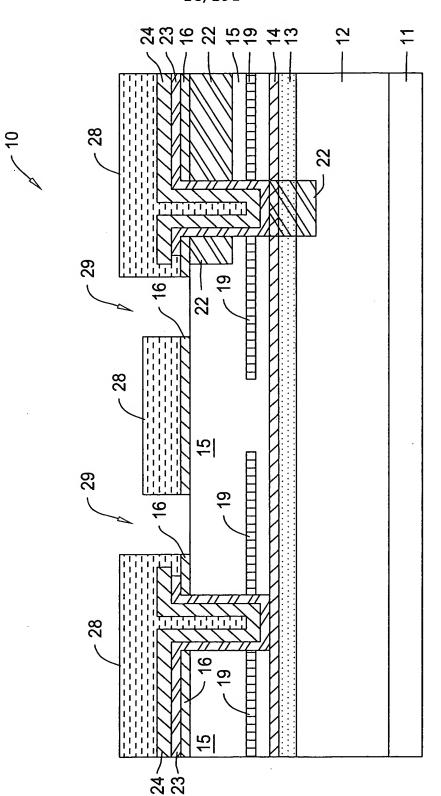
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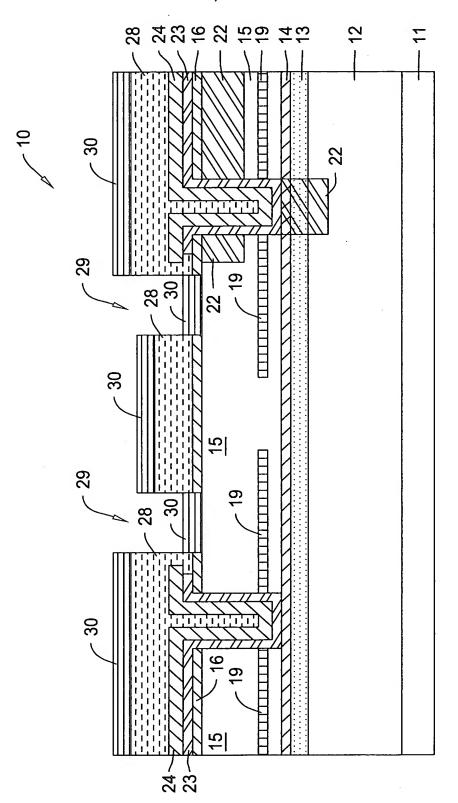
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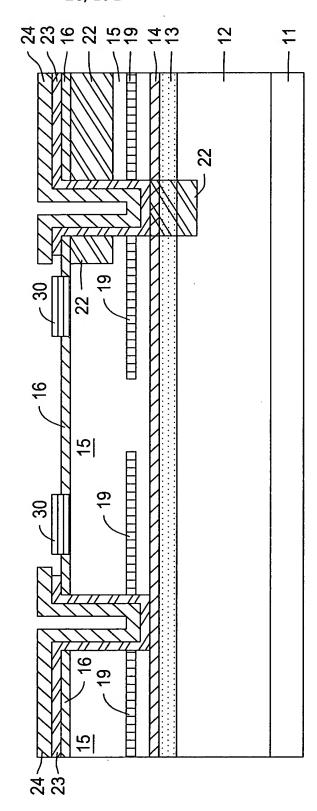
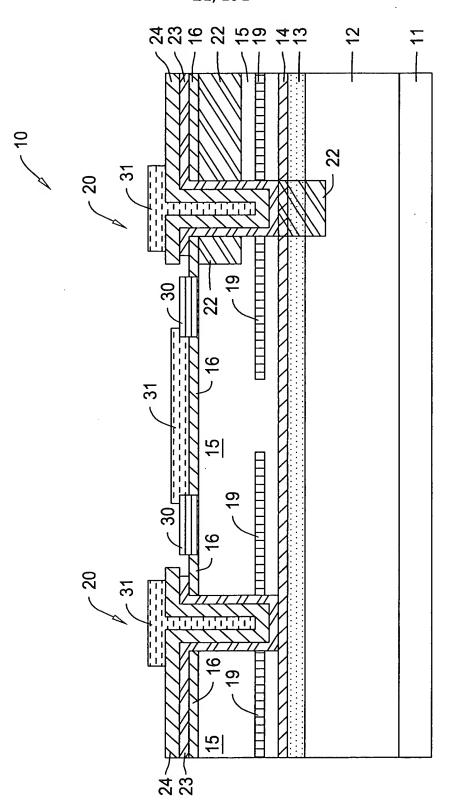


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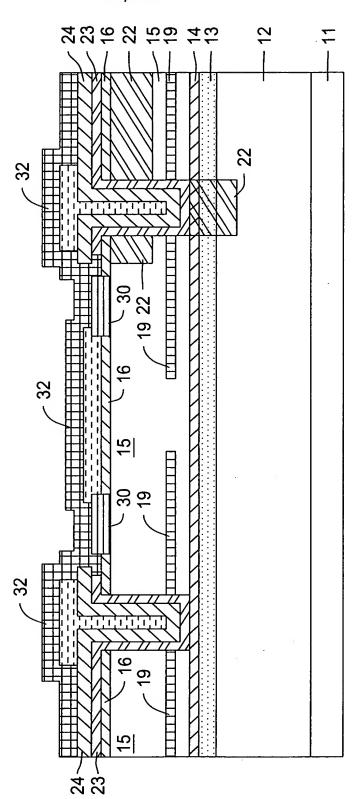
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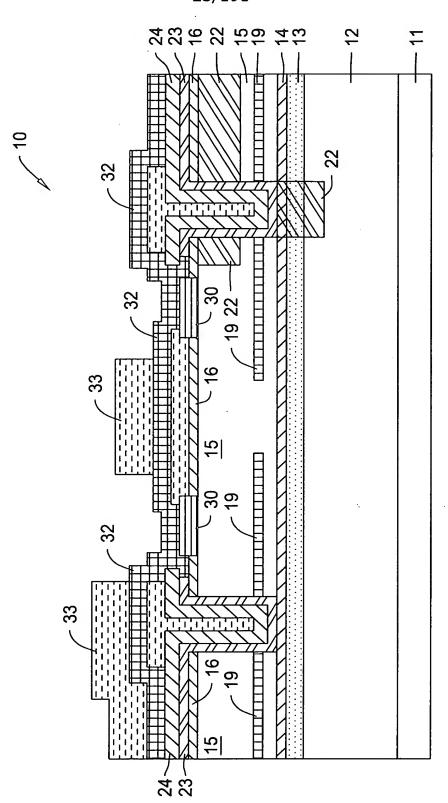
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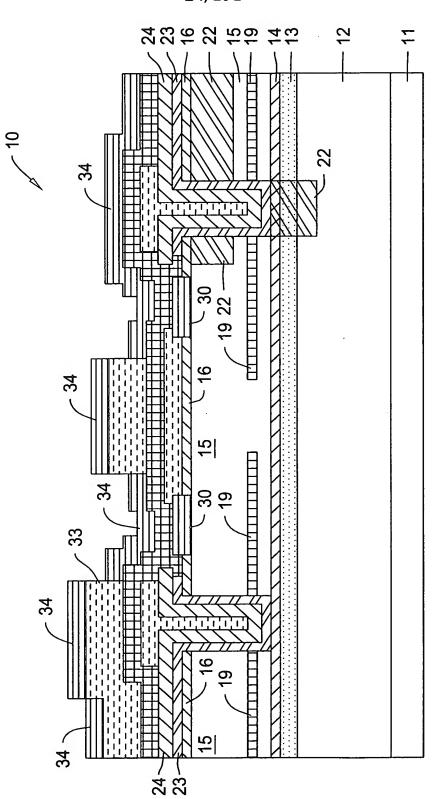
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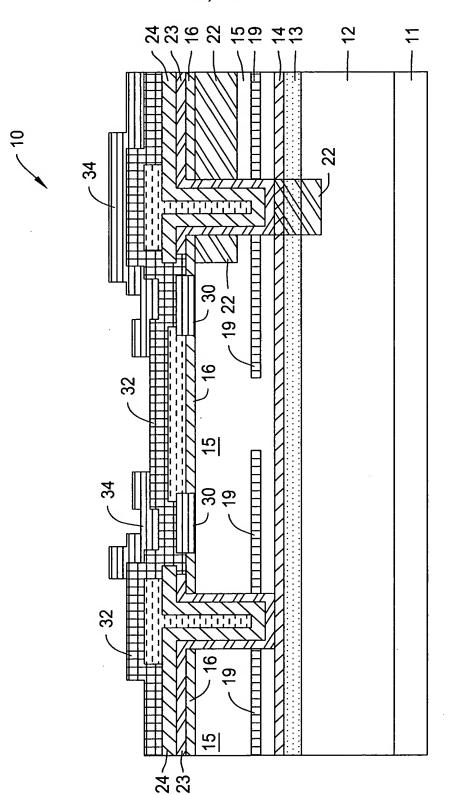


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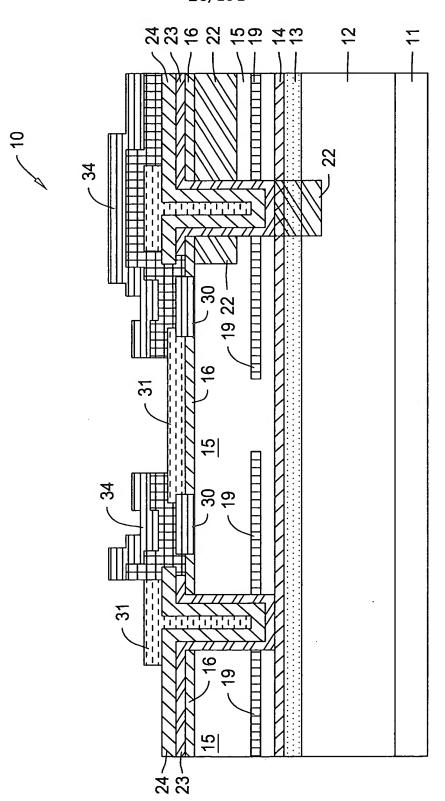
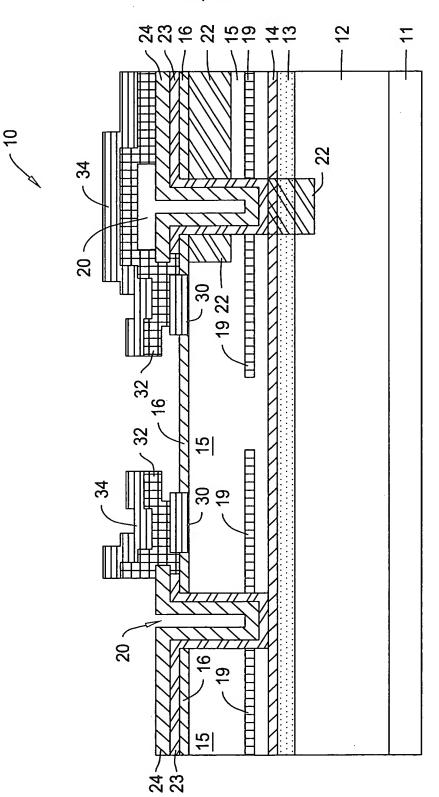


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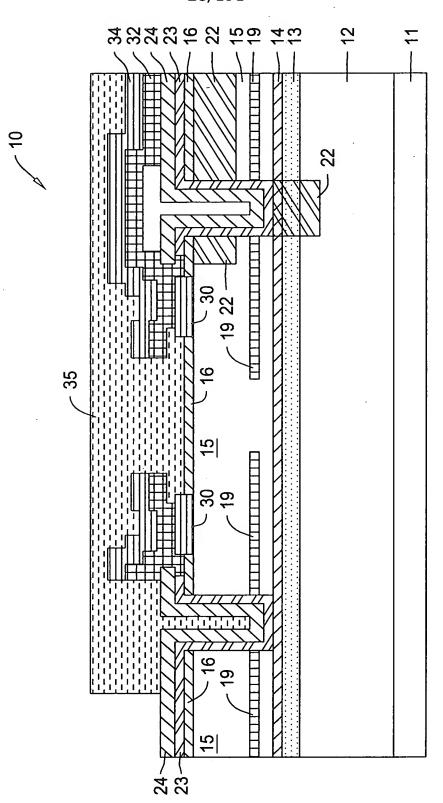
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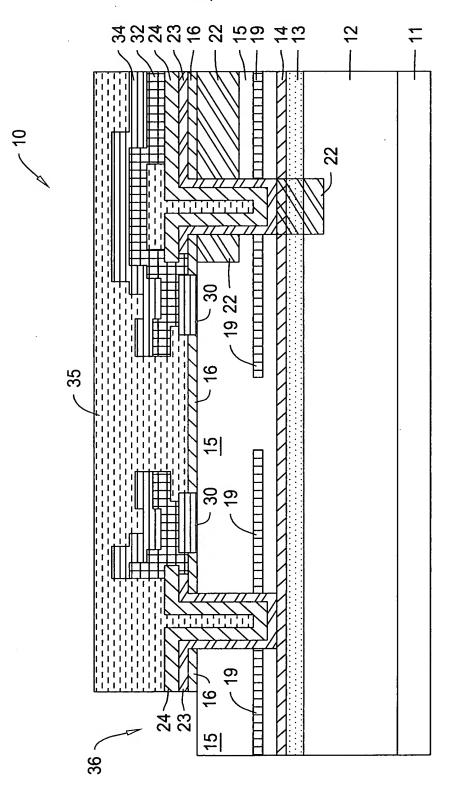
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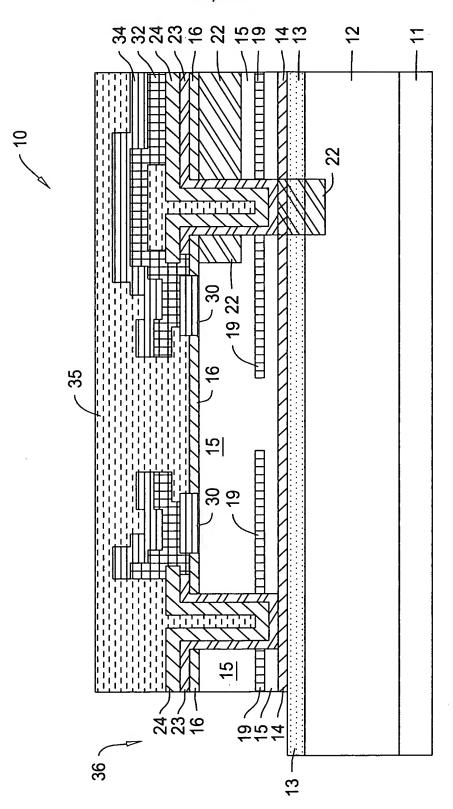


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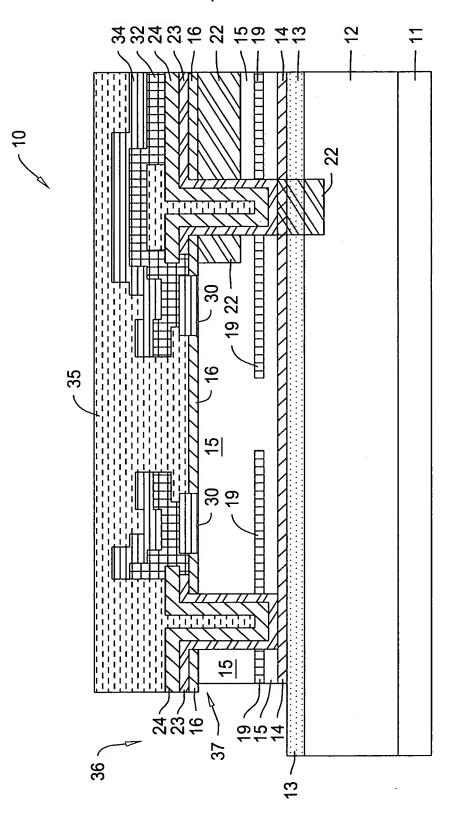
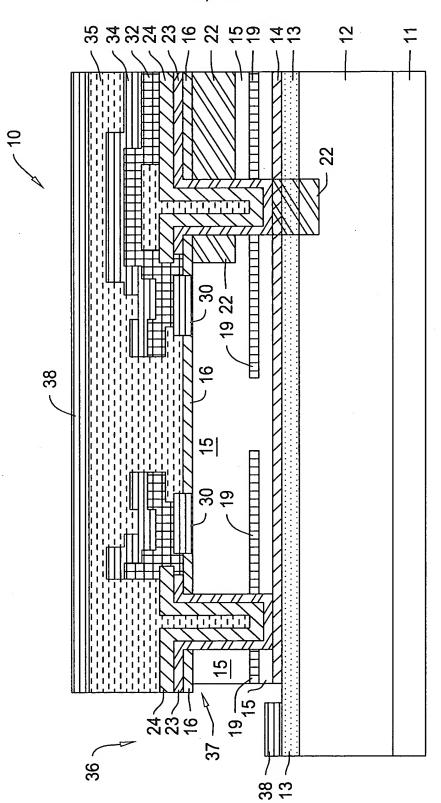


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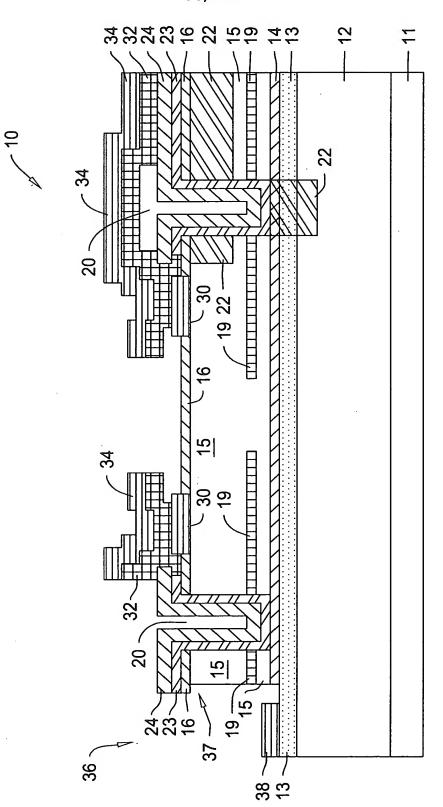
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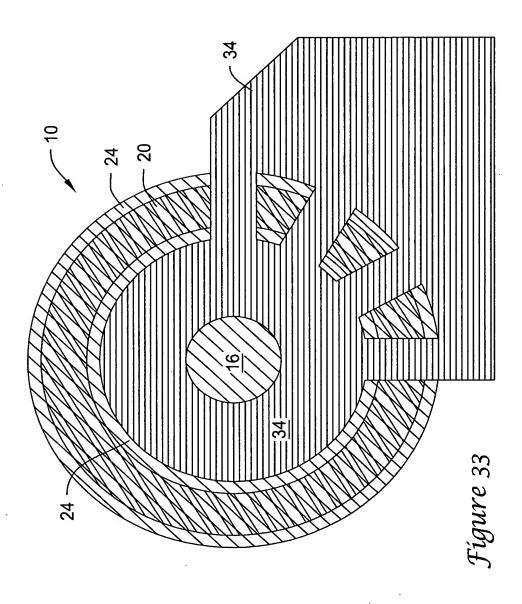
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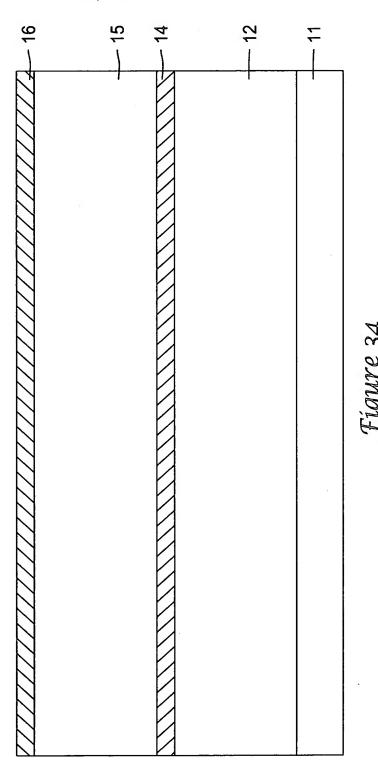
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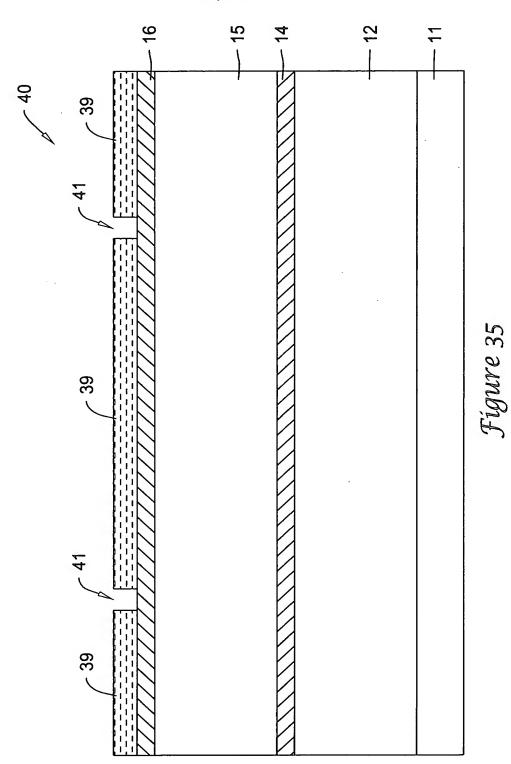
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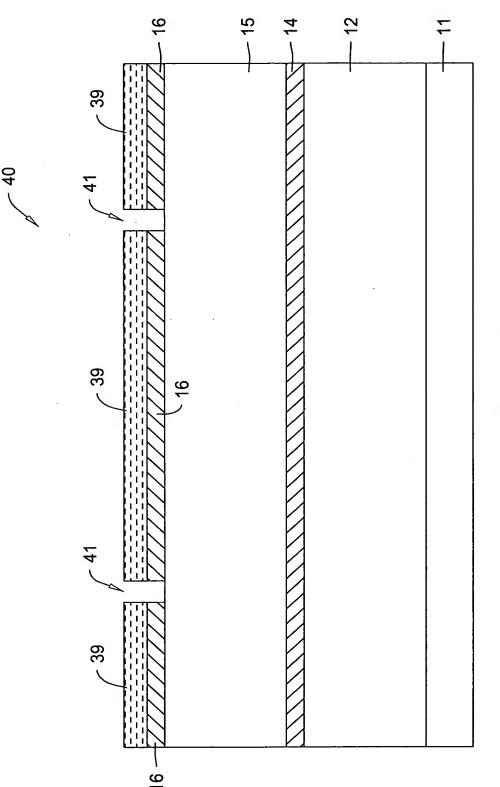
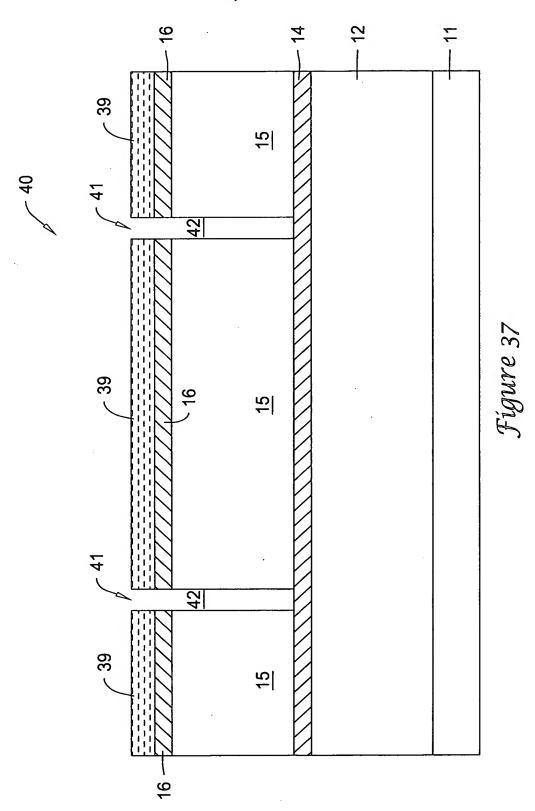


Figure 36

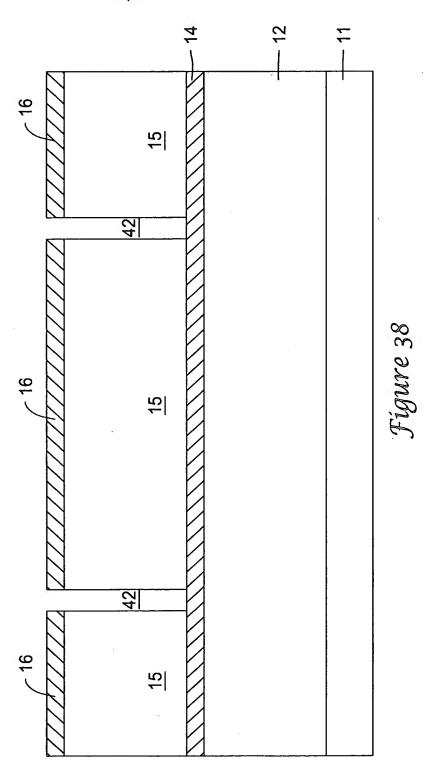
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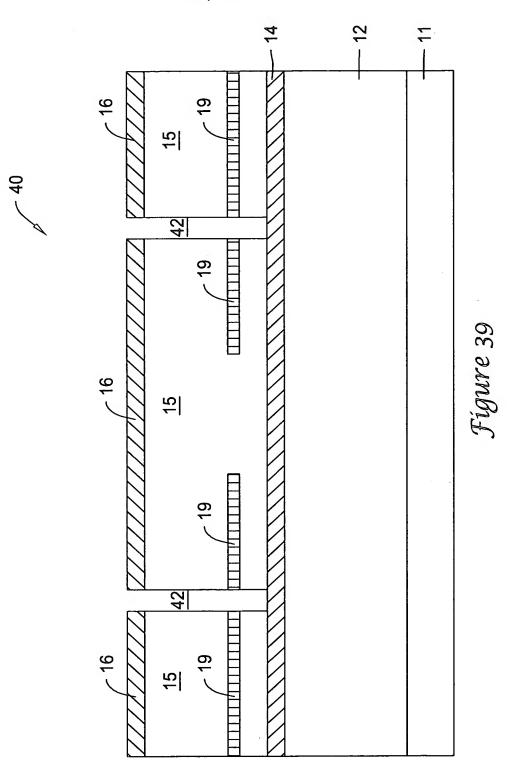
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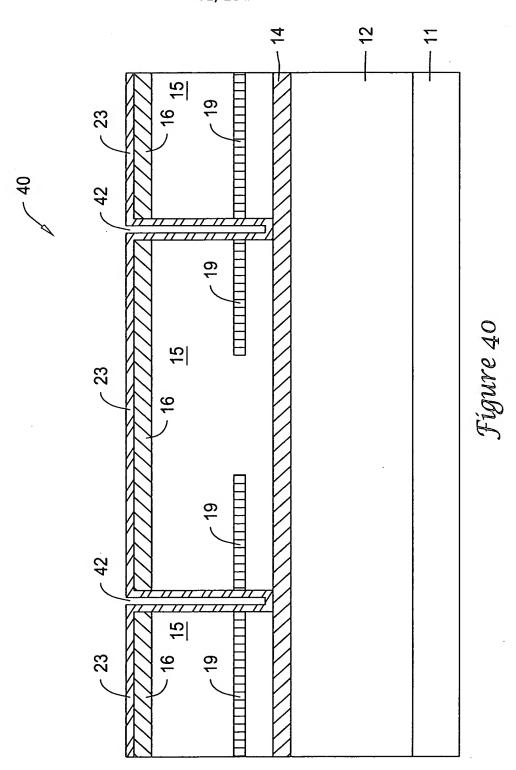


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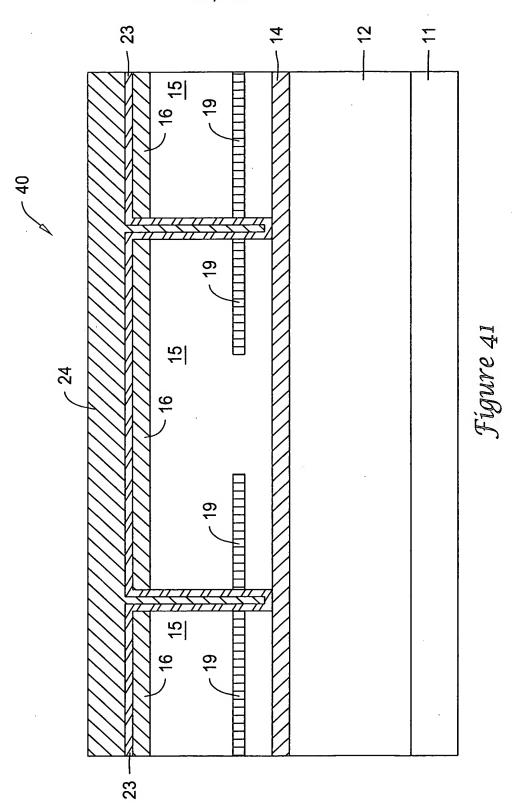


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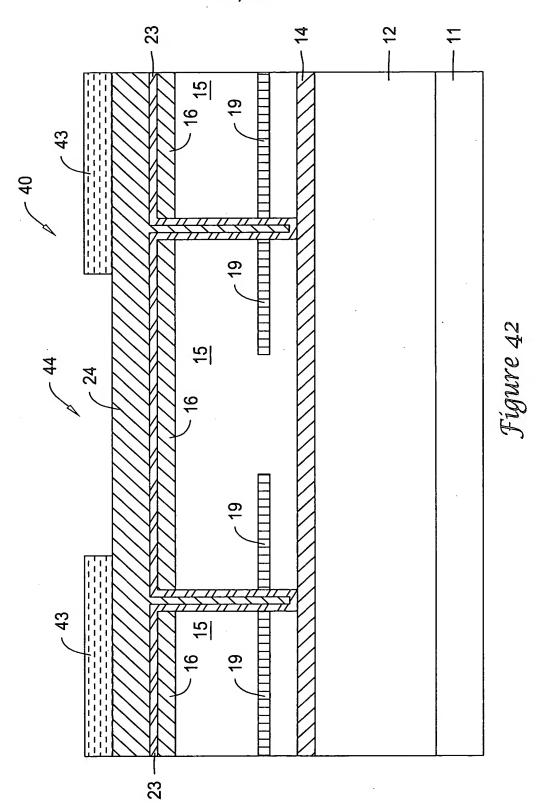
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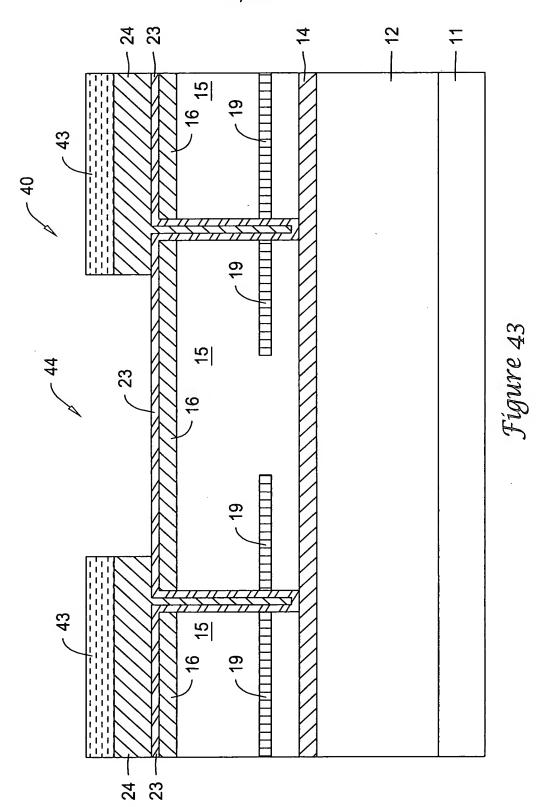
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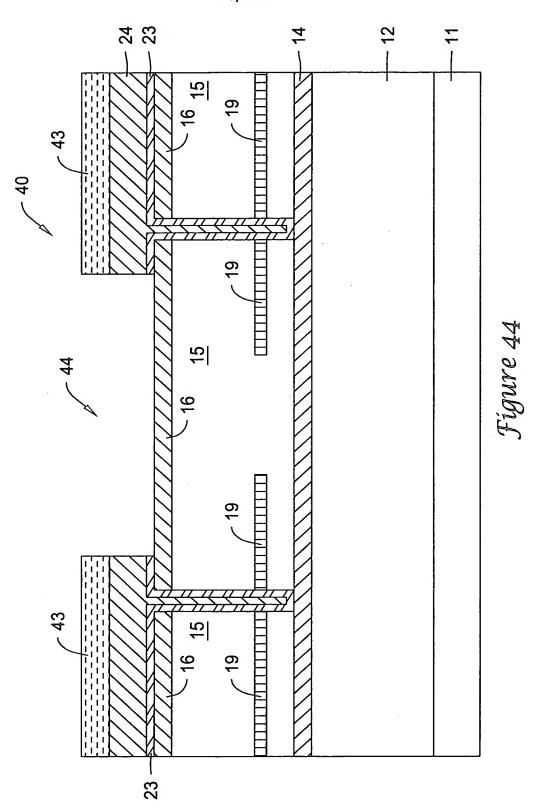
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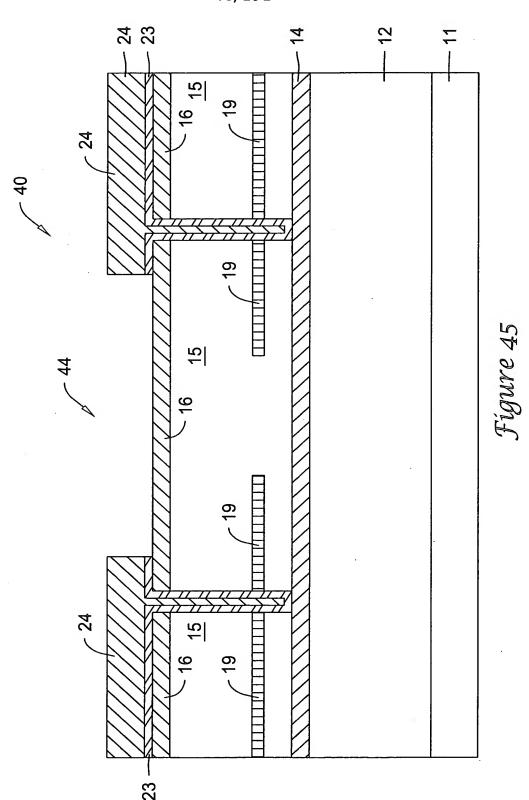
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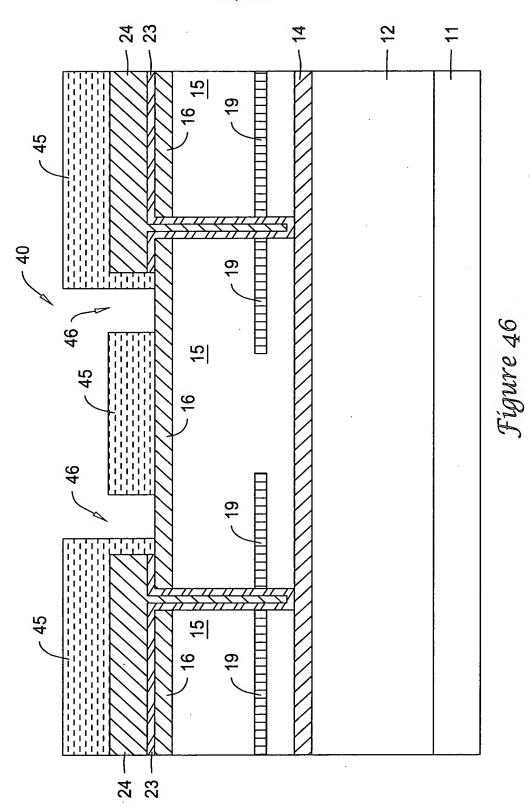
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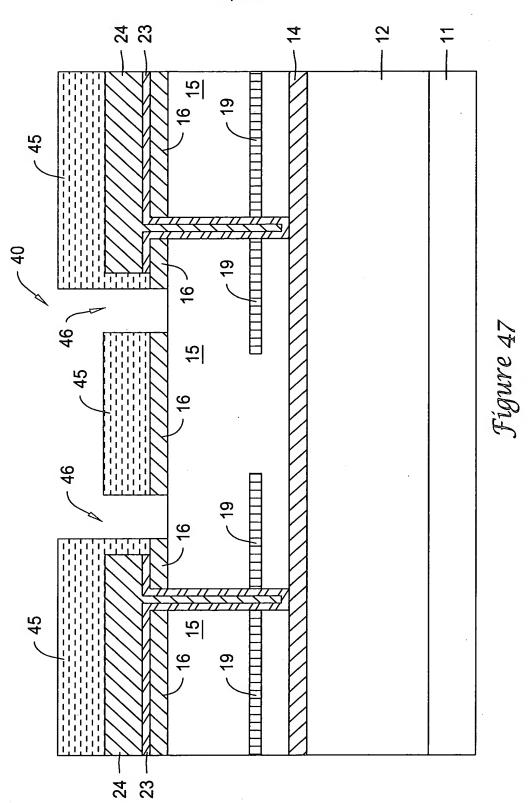
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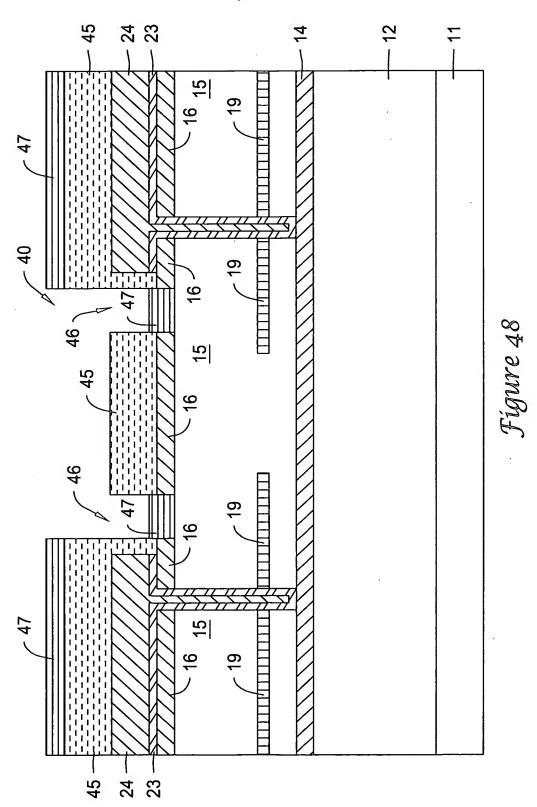
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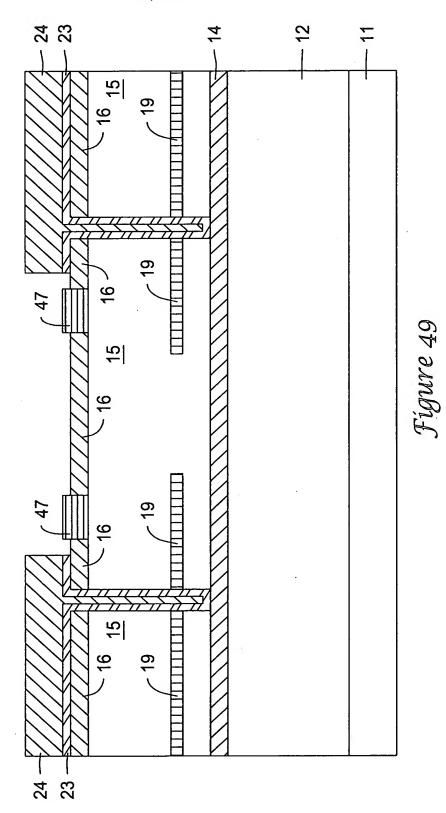
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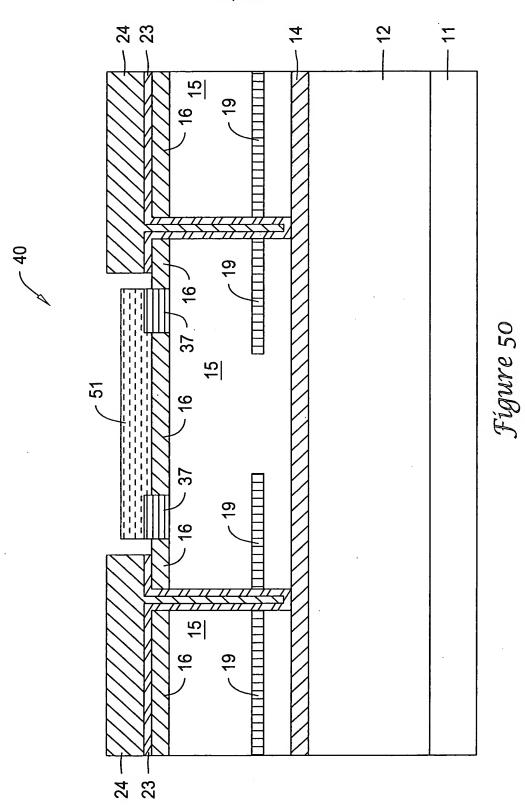
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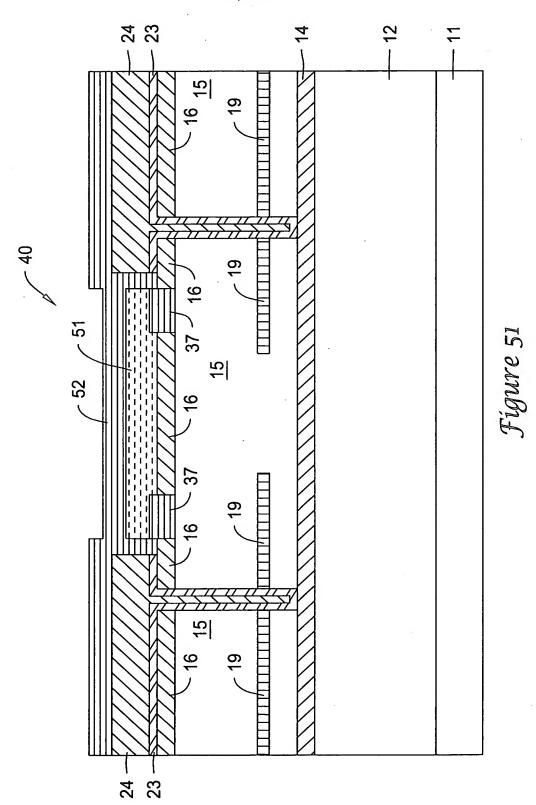
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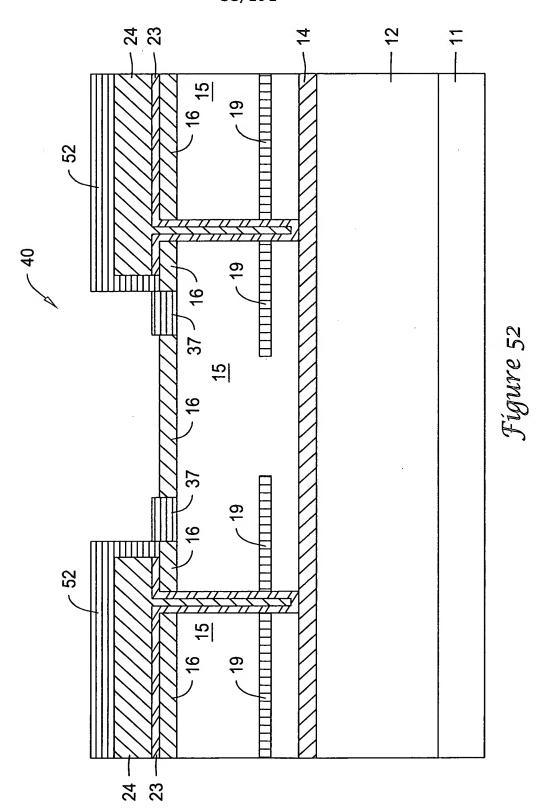
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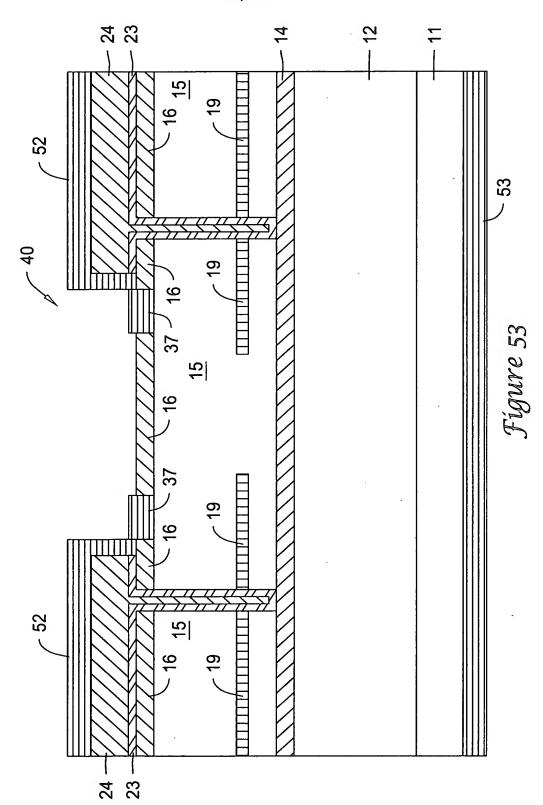


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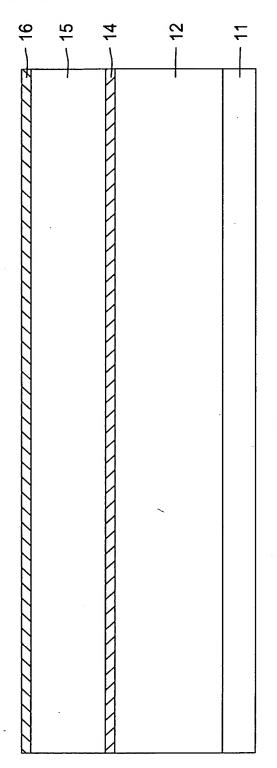
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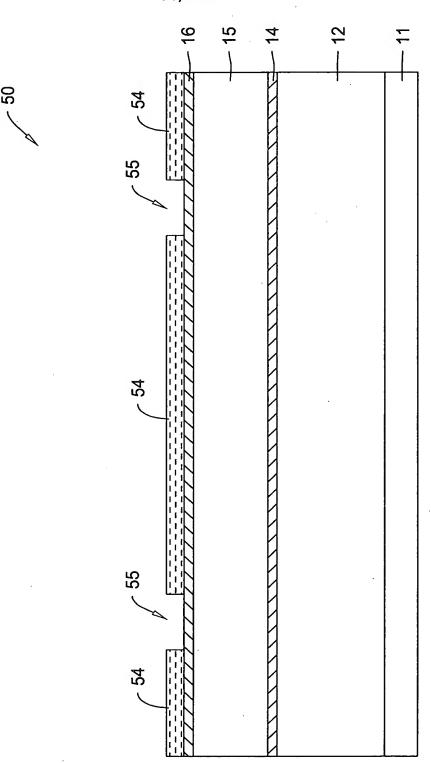


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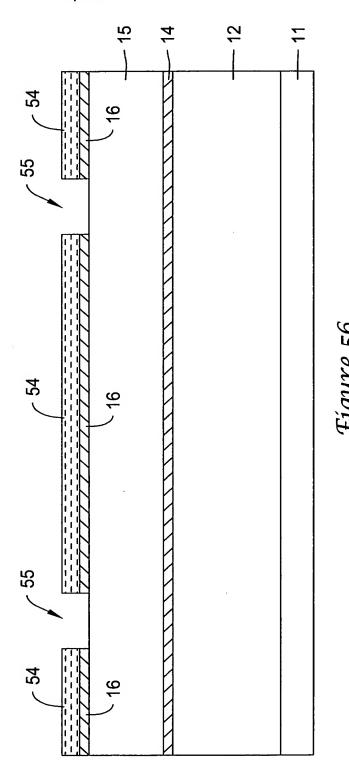


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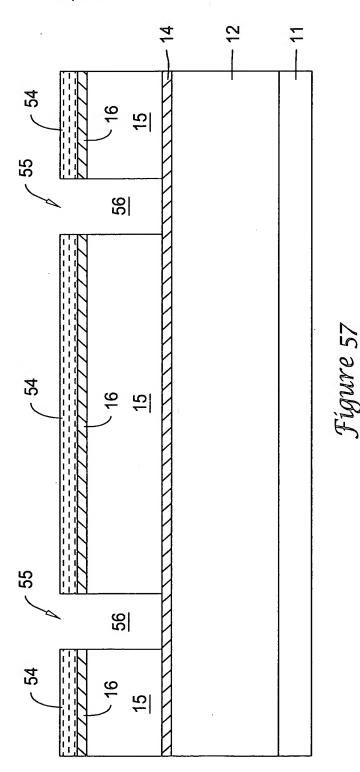


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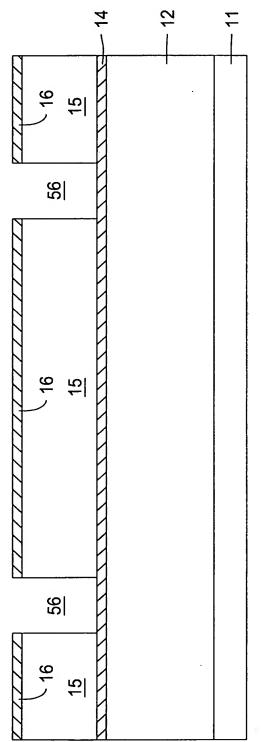
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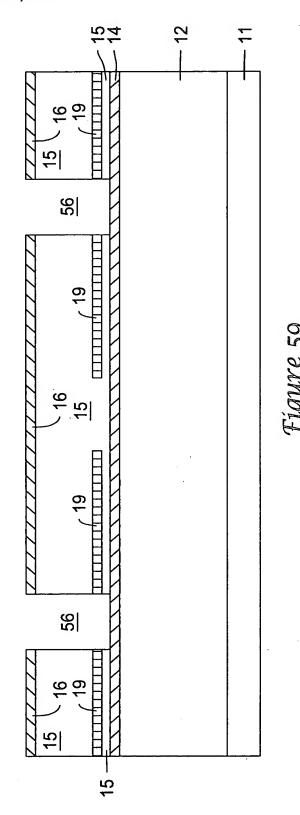
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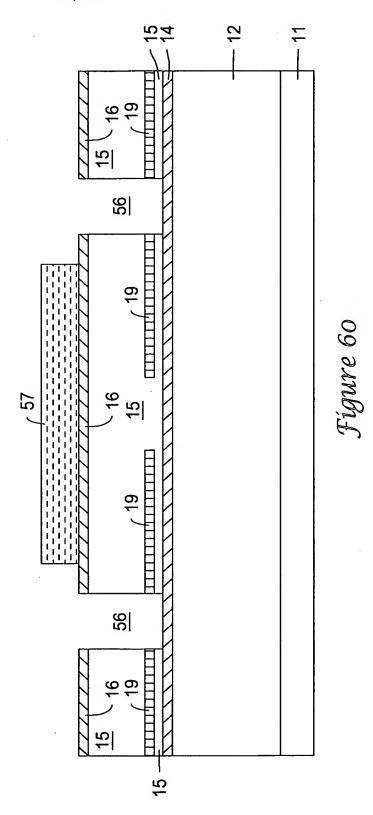
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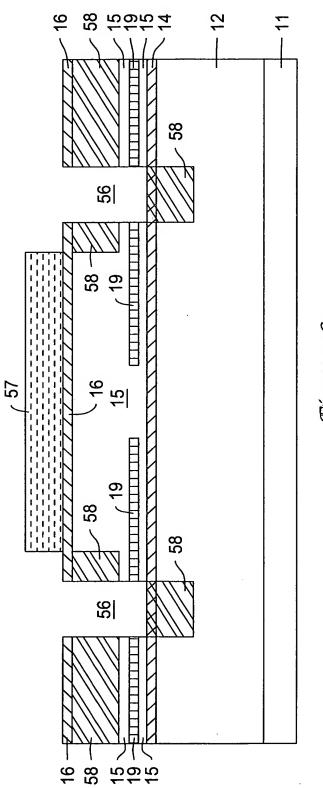
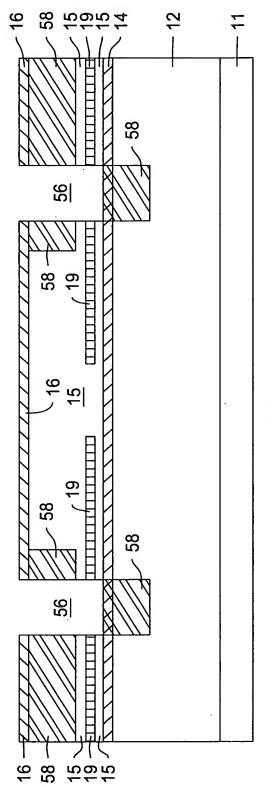


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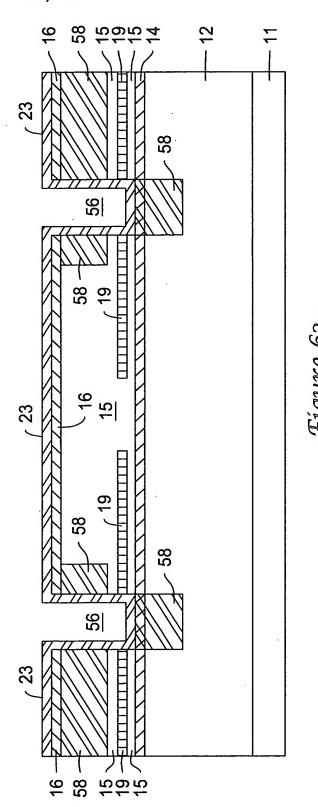
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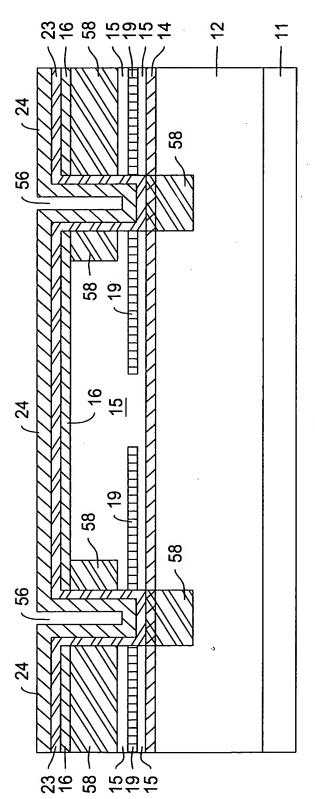
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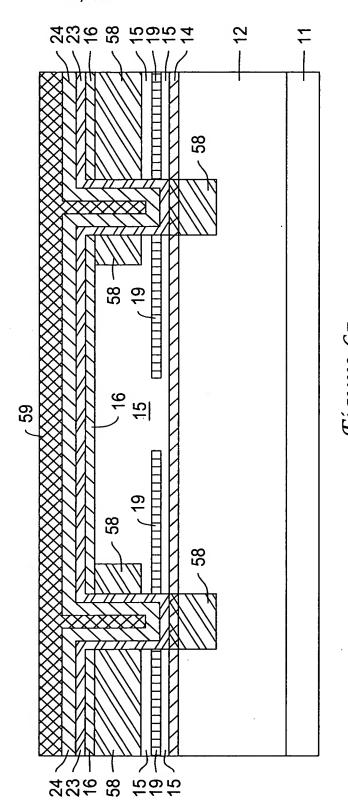
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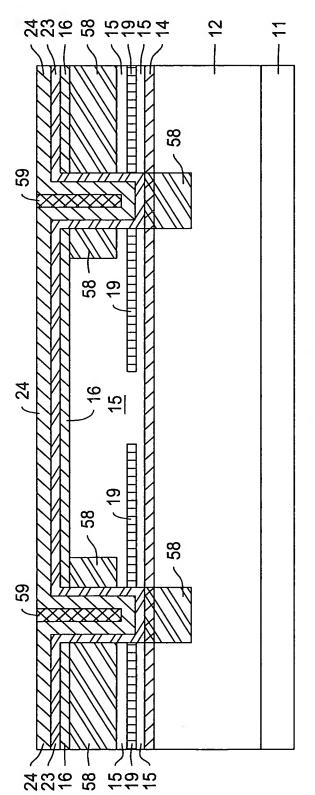
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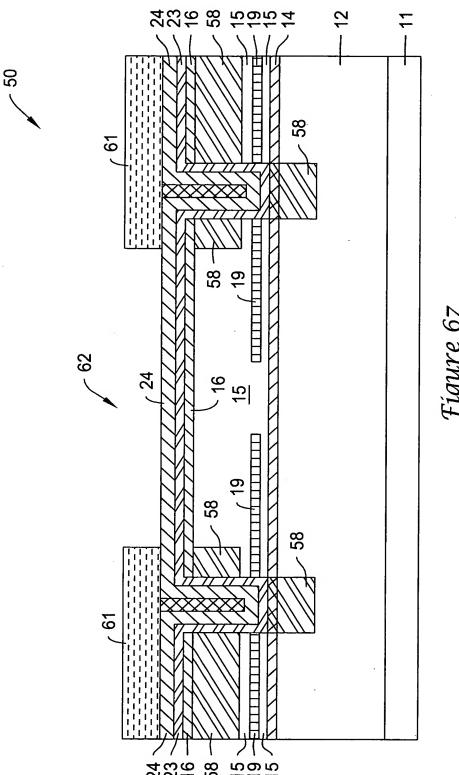
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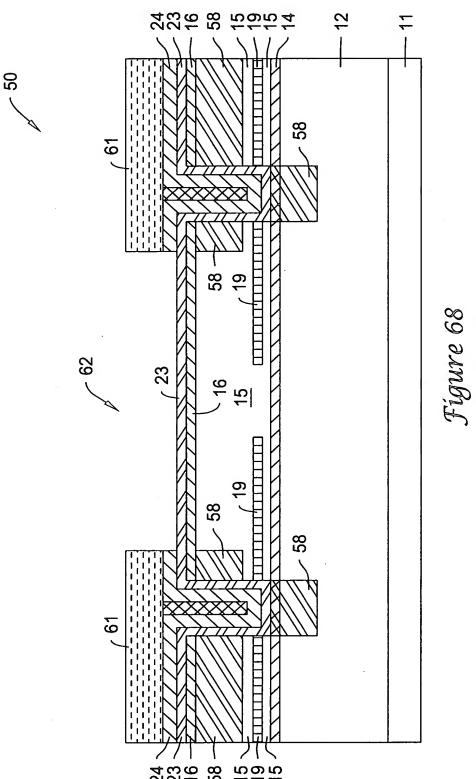
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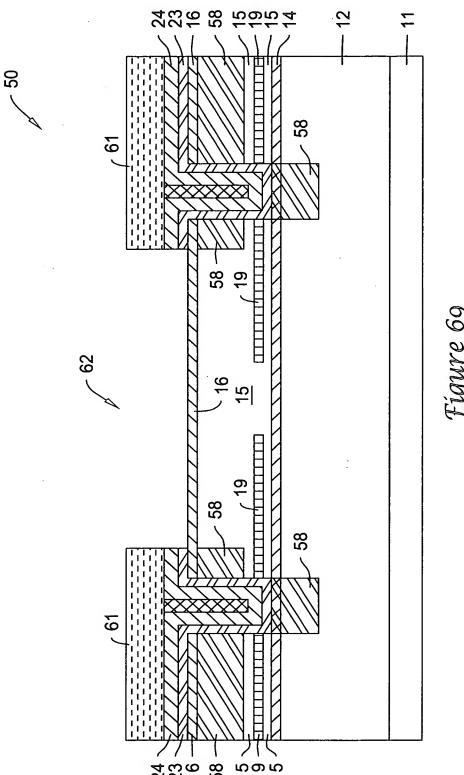
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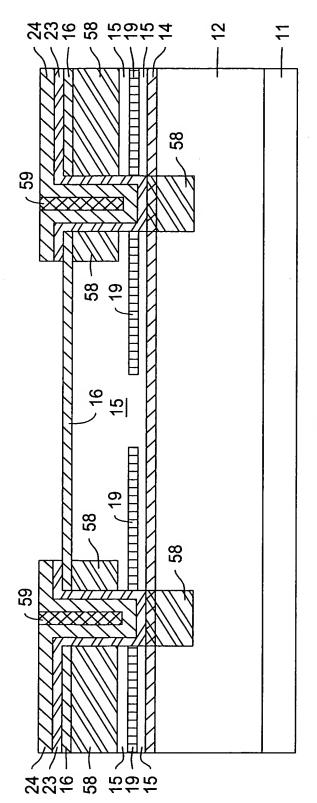
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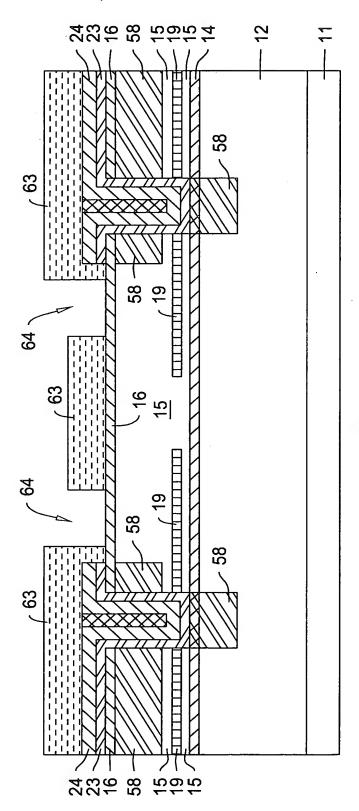
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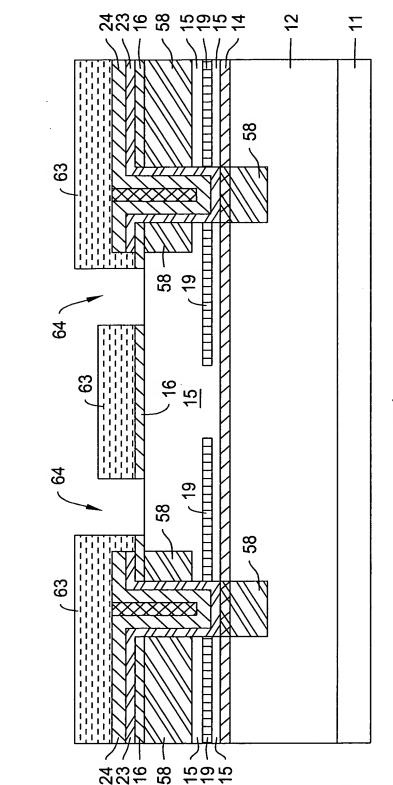
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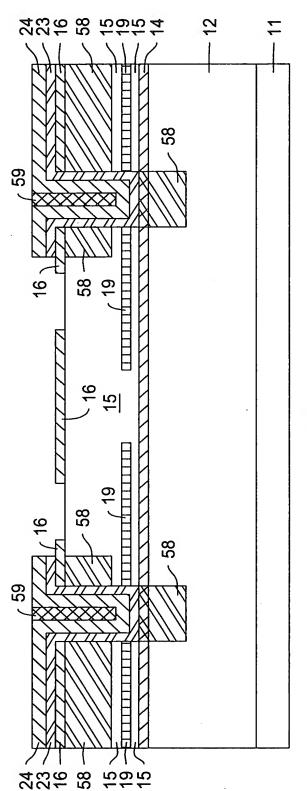
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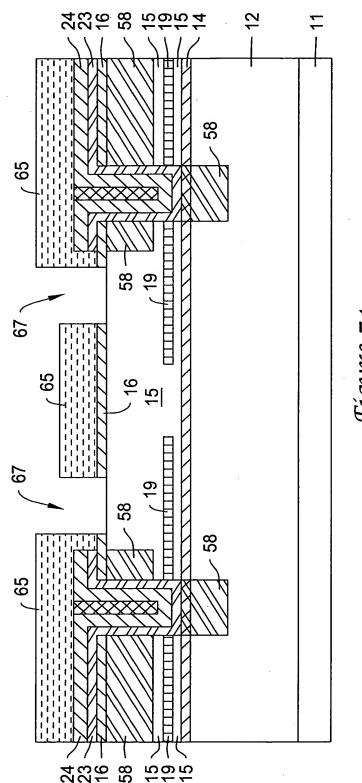


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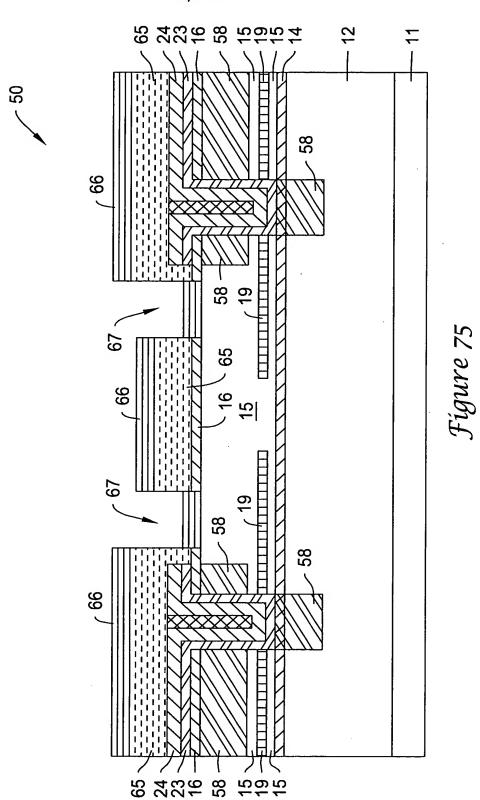
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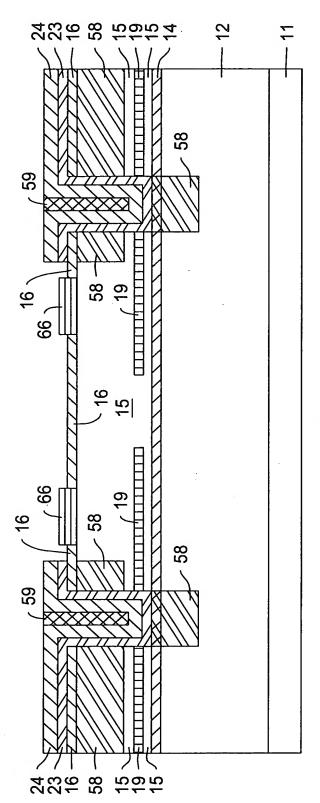
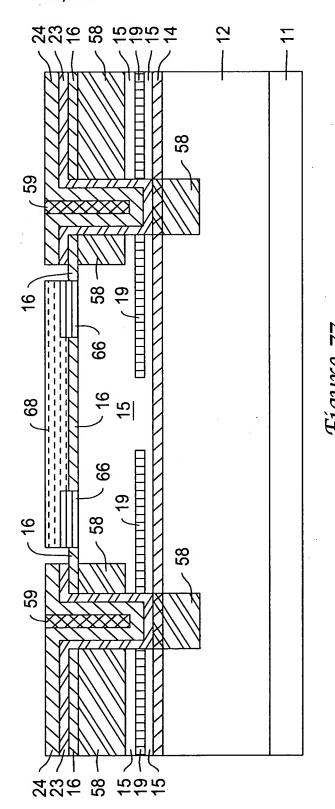


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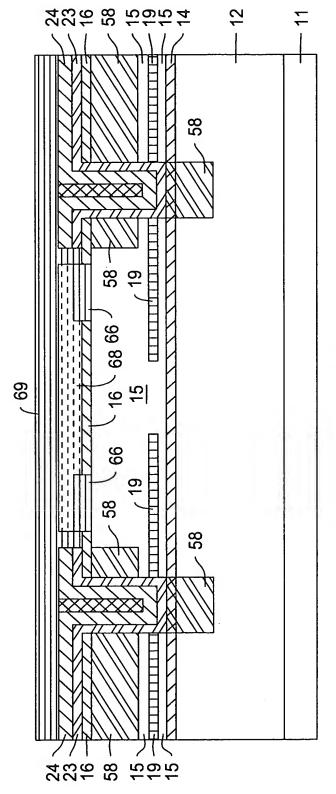
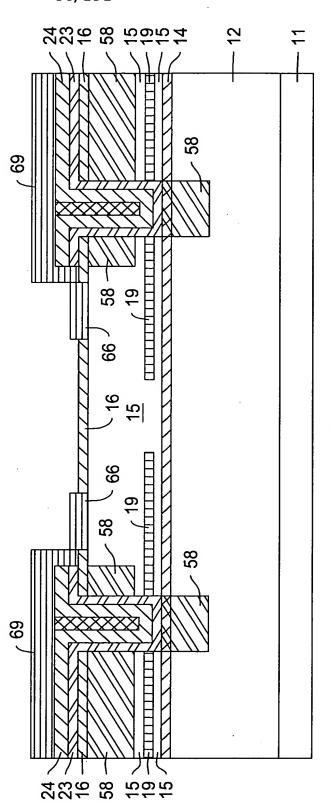
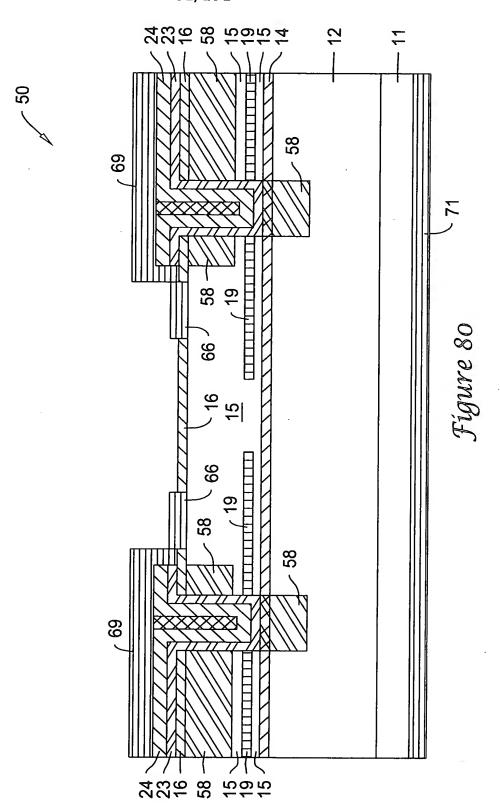


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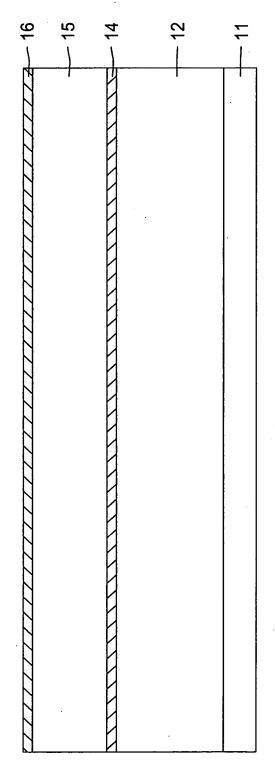
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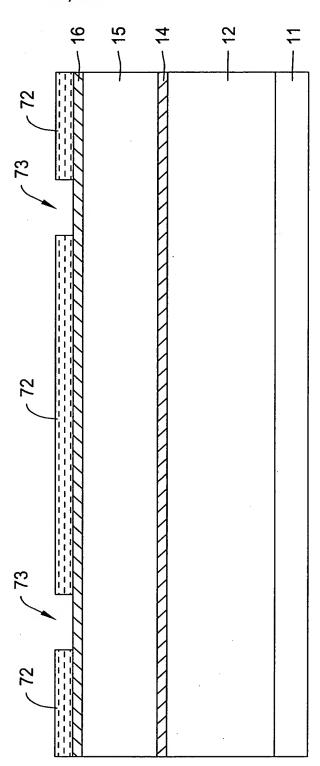
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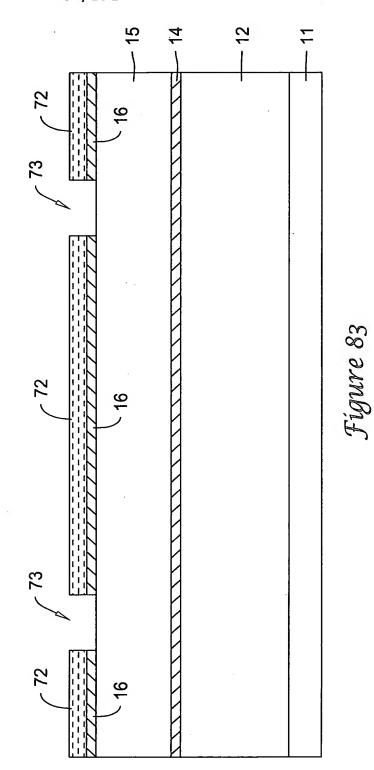
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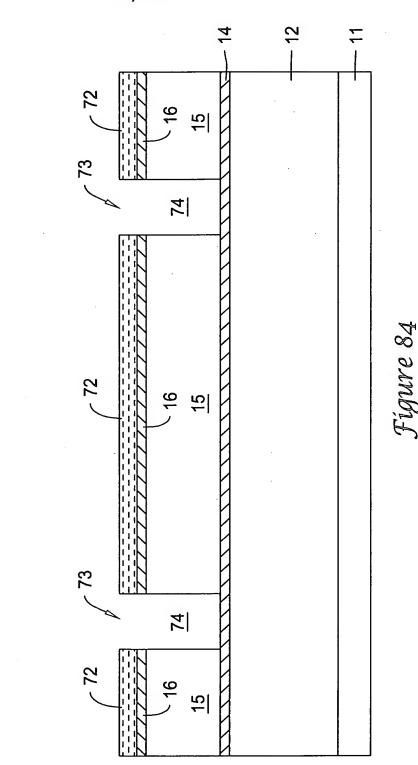


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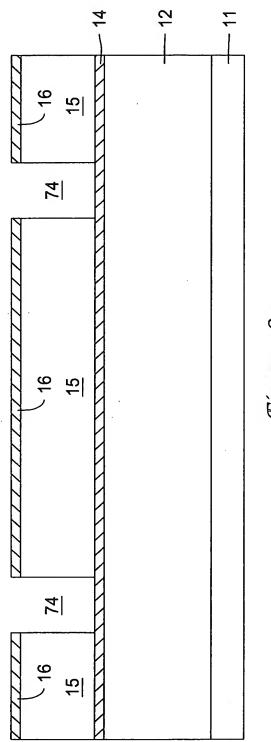
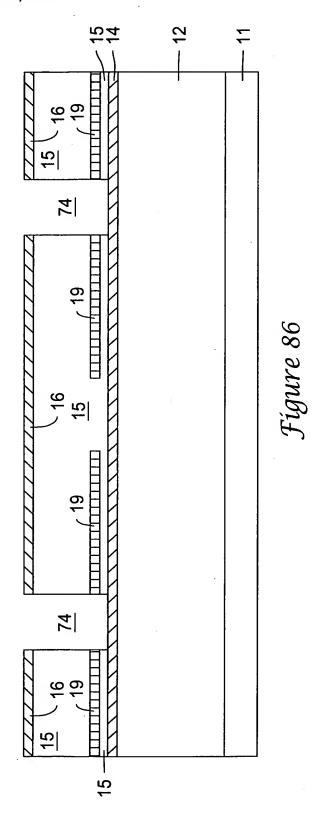


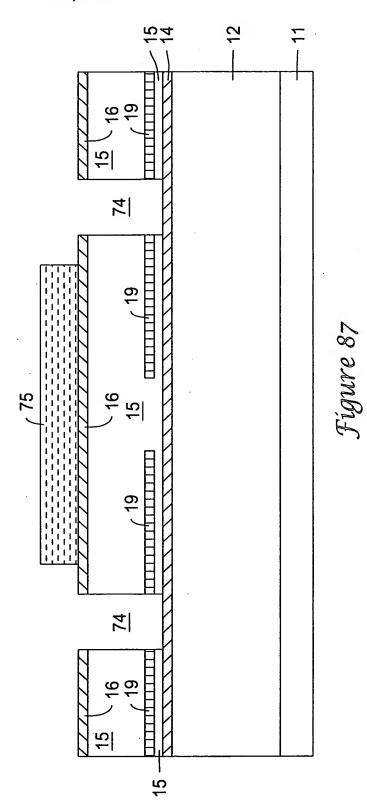
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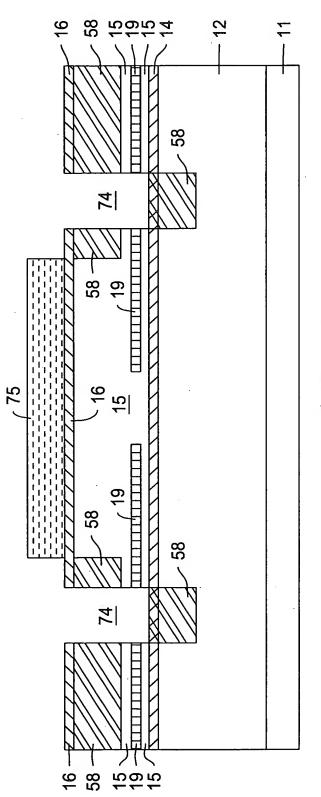
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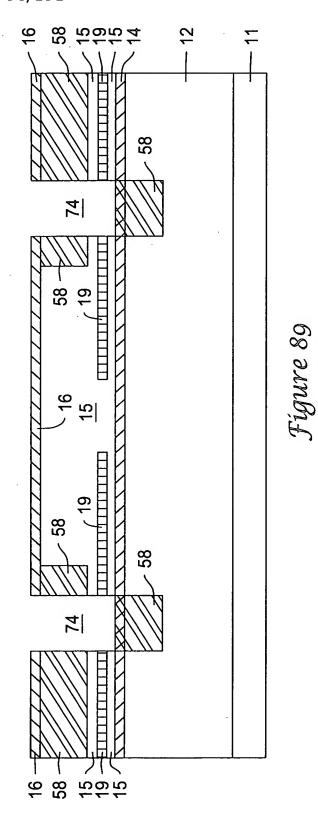
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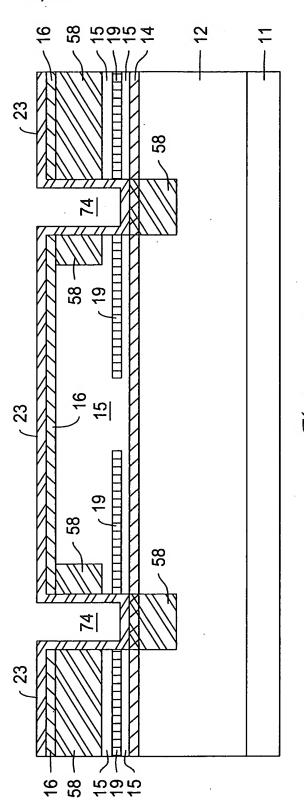


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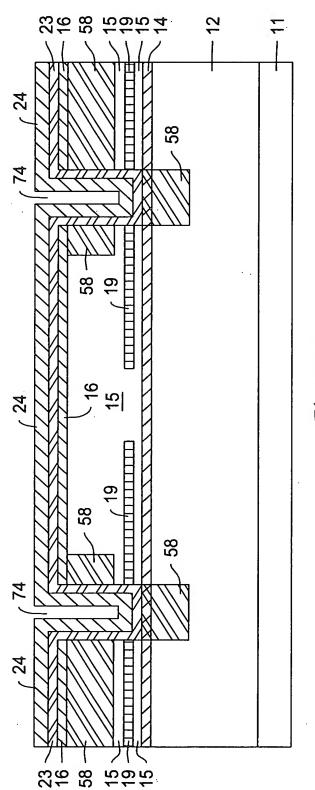
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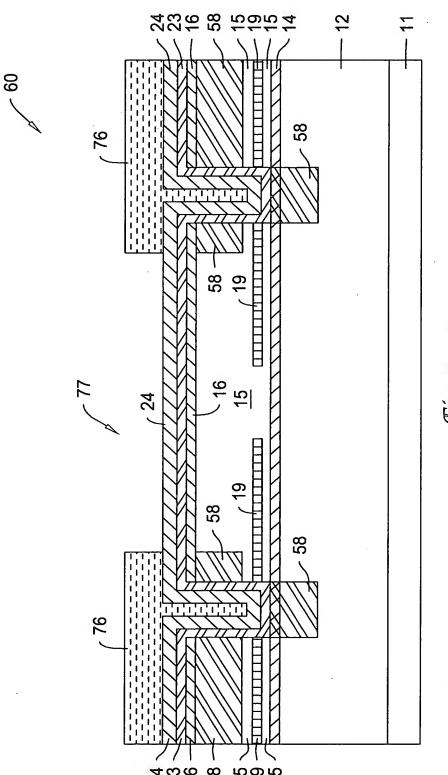
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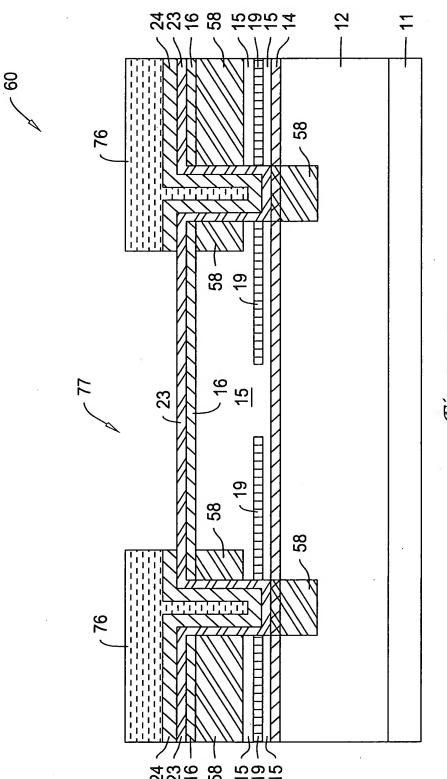
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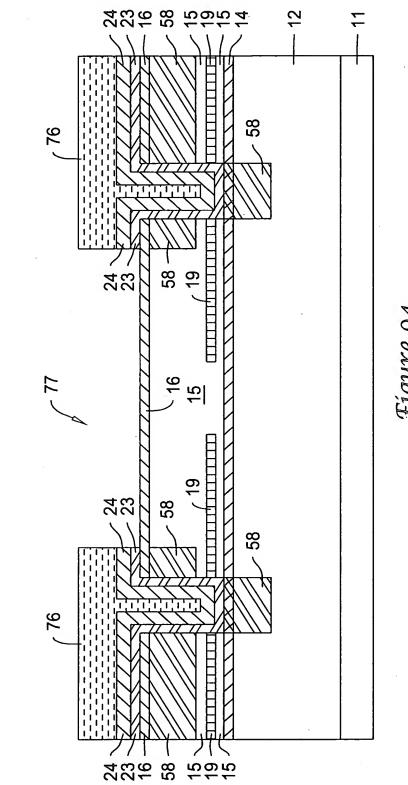
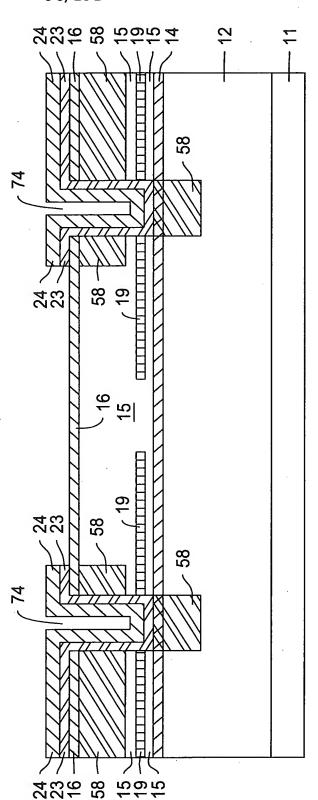


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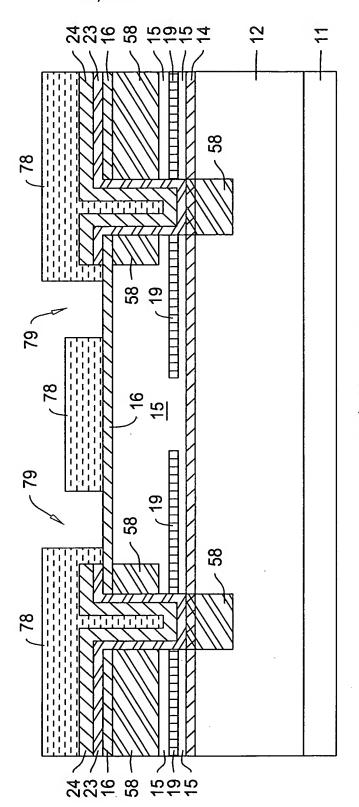
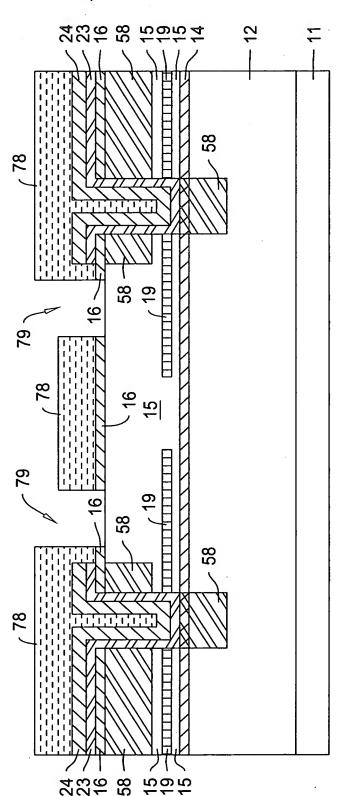


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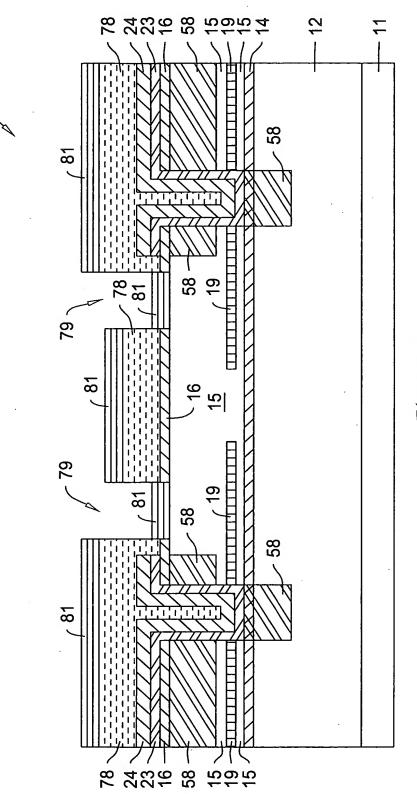
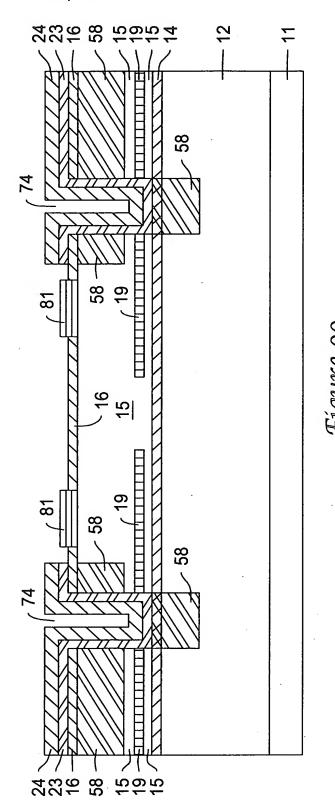


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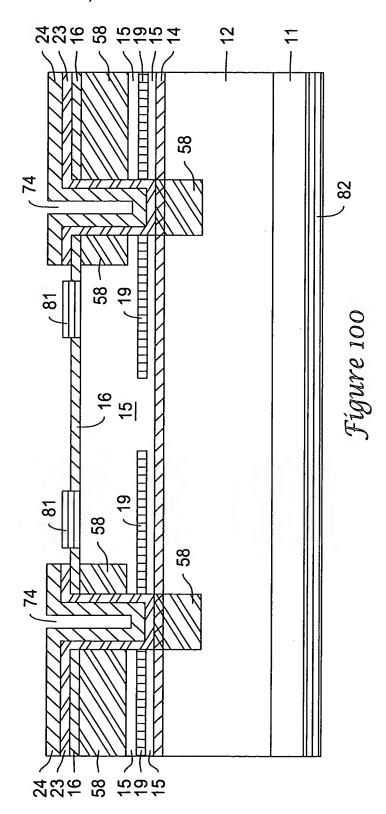
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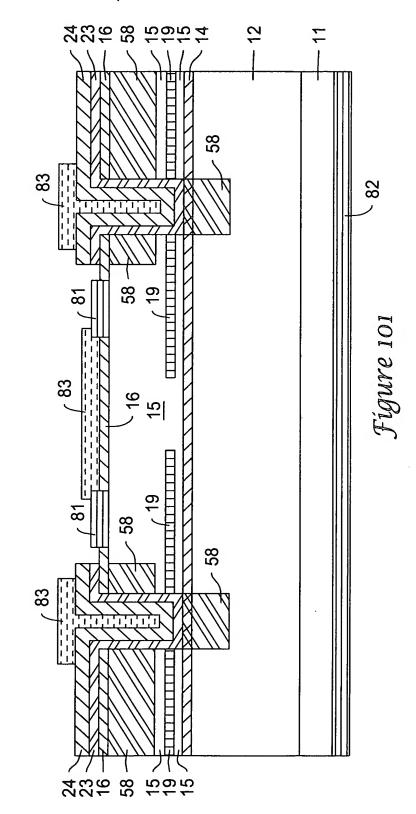




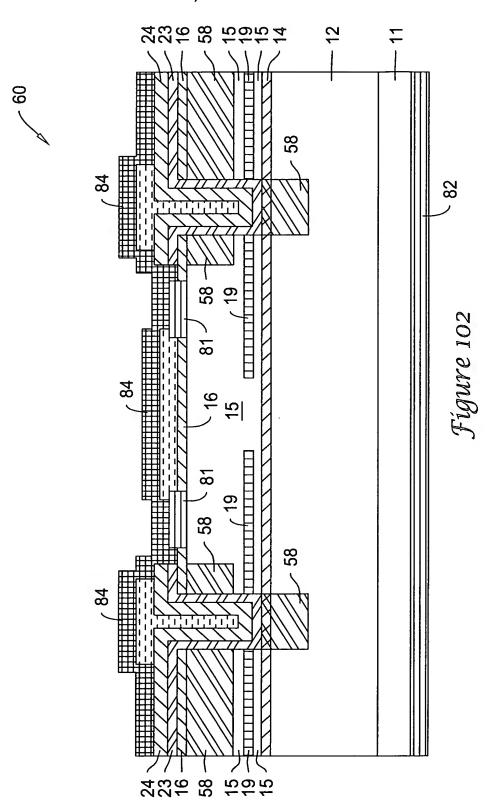
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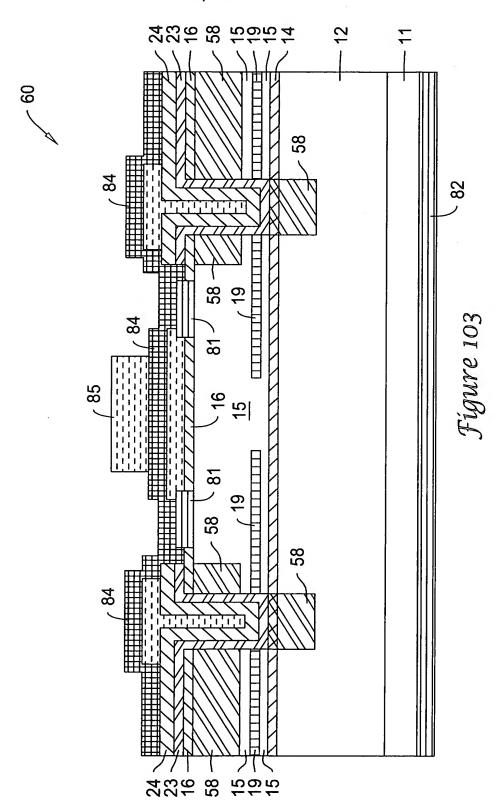


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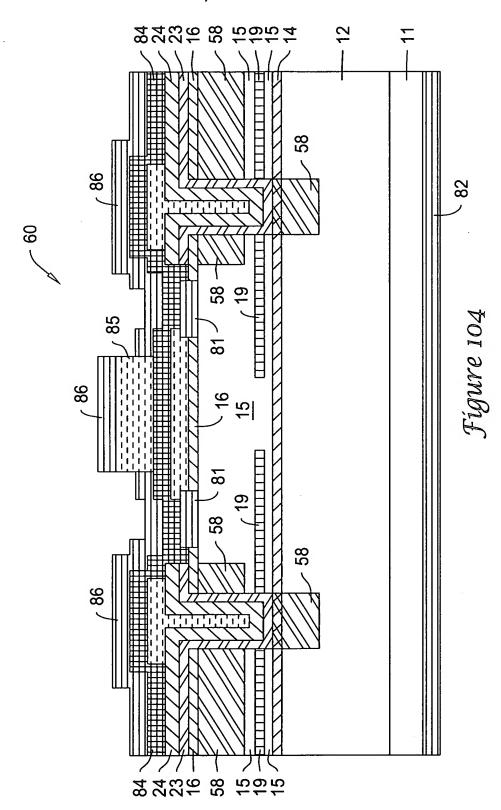
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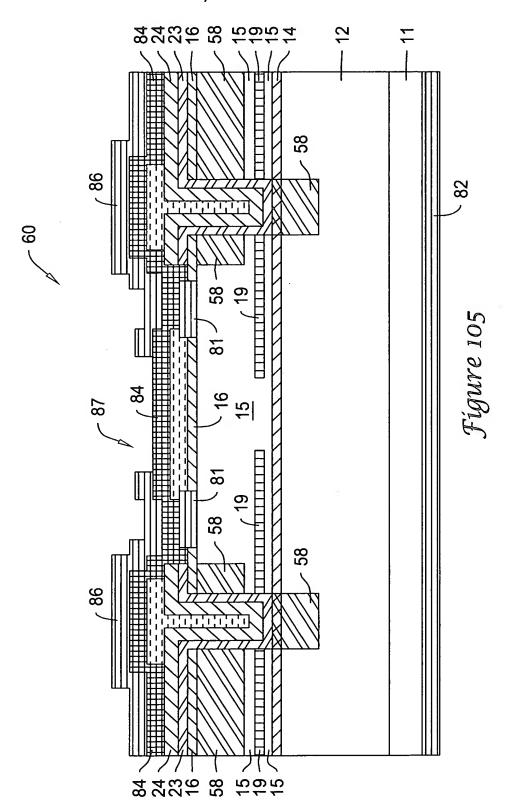
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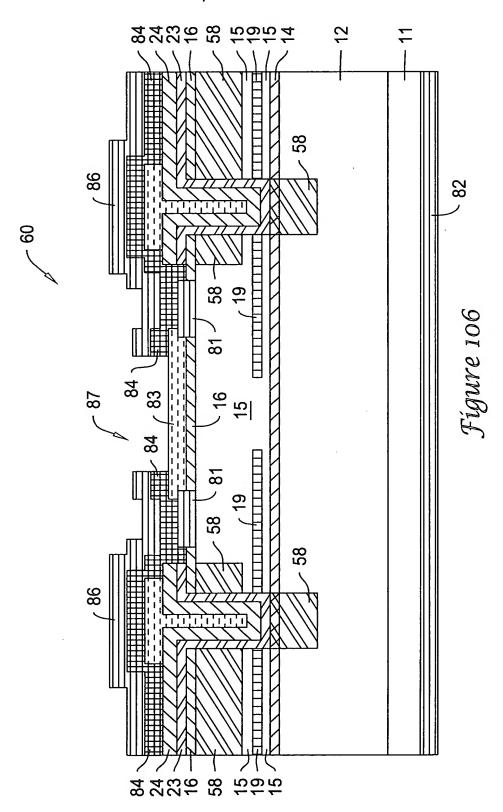


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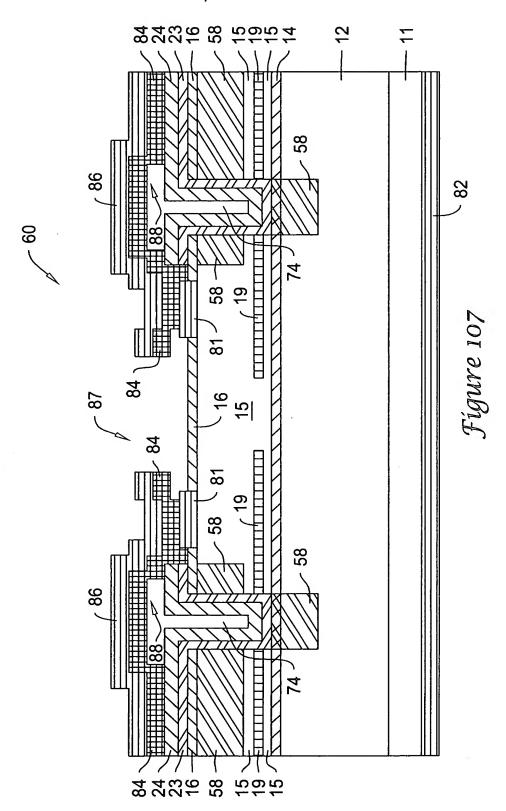


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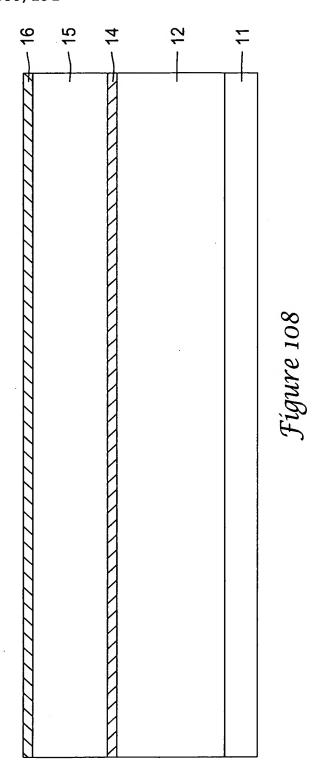


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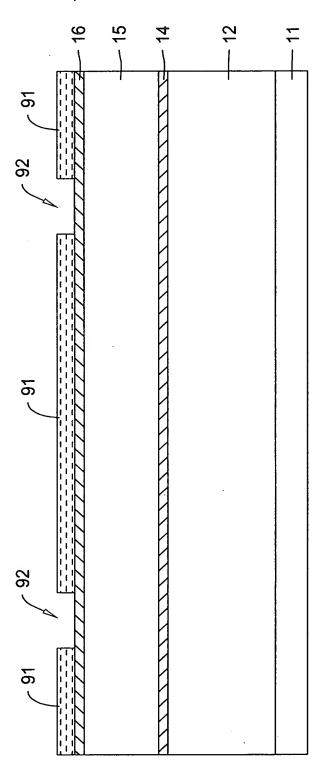
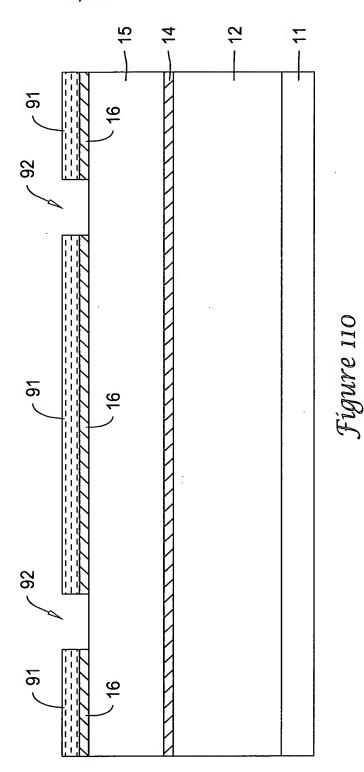
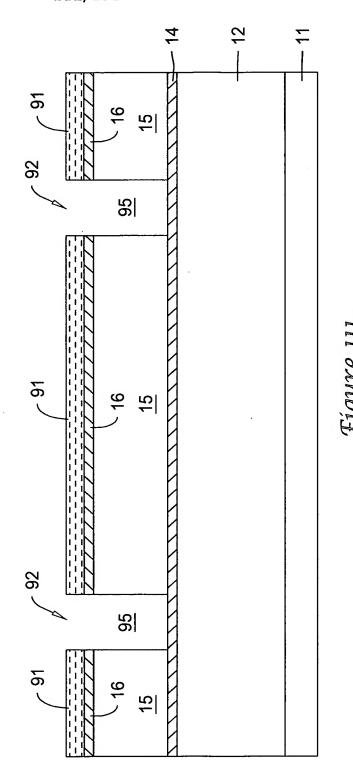


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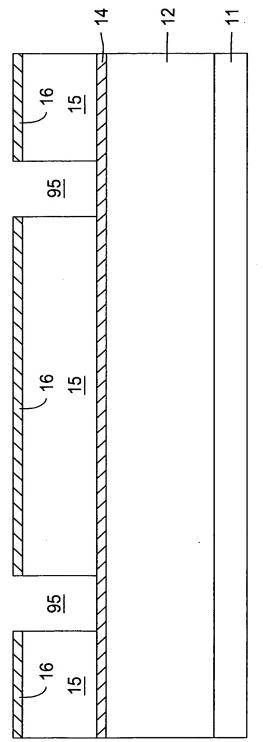
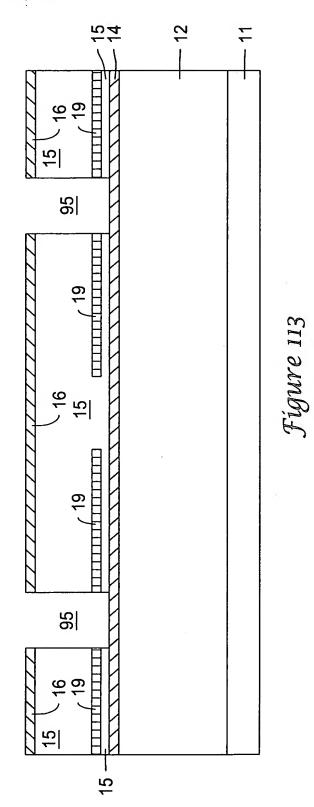


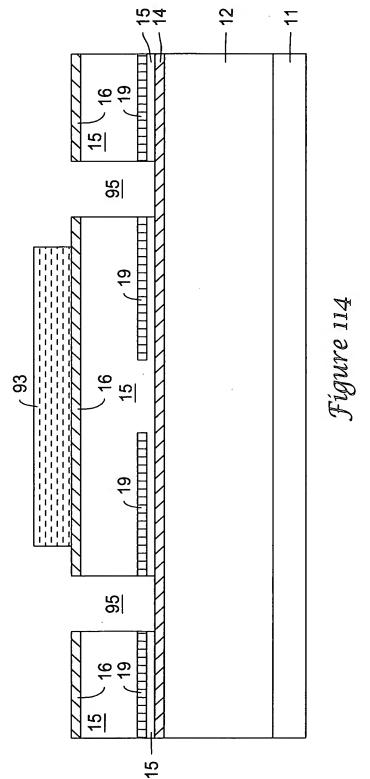
Figure 112

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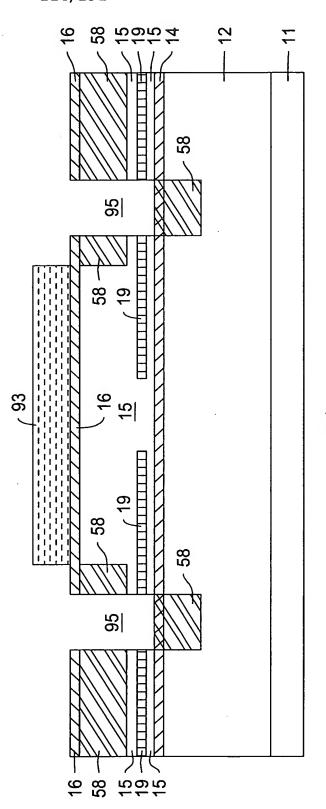
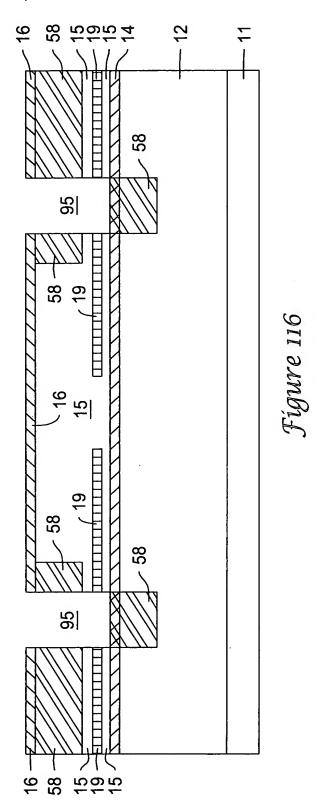


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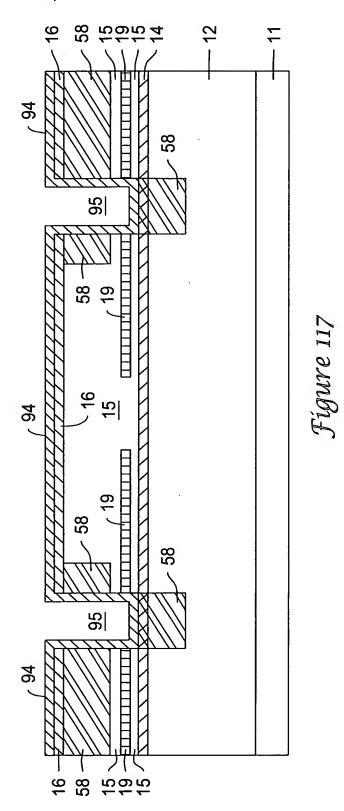
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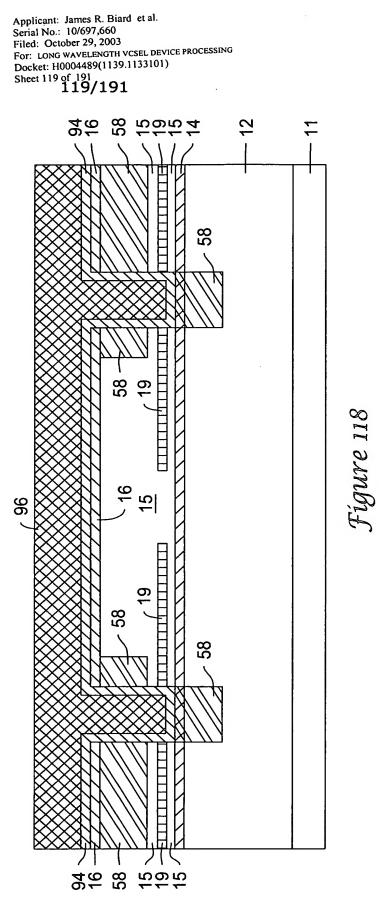




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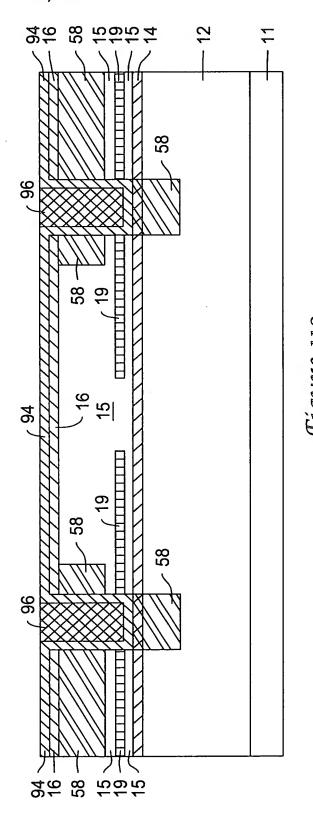
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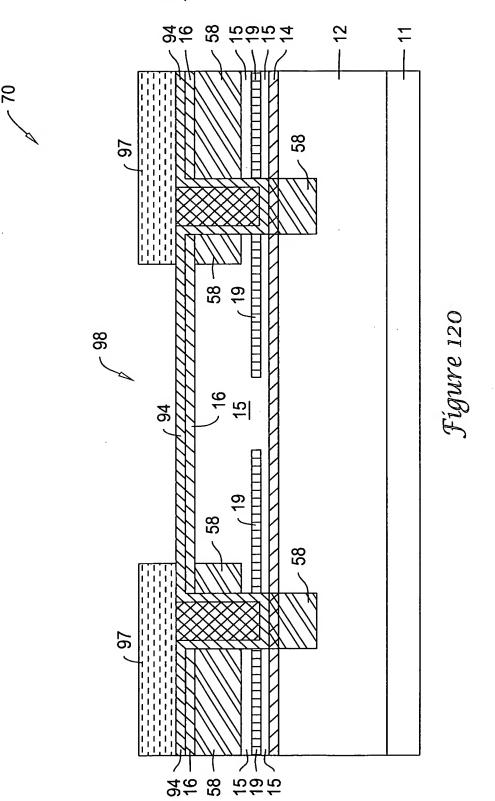
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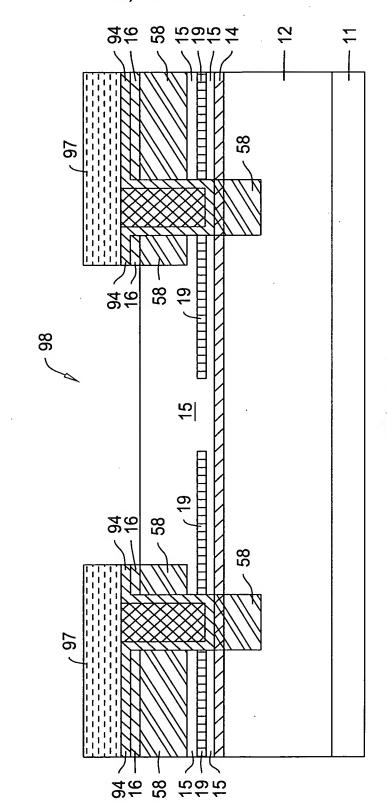
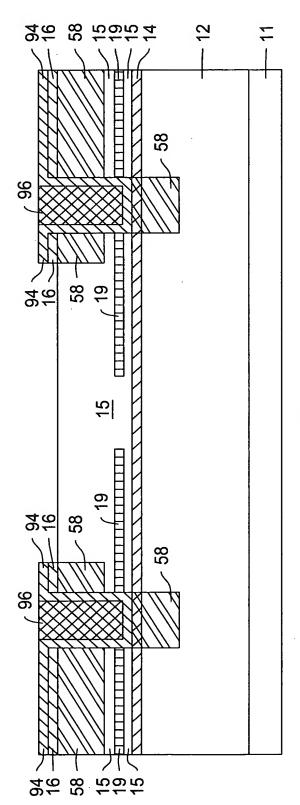


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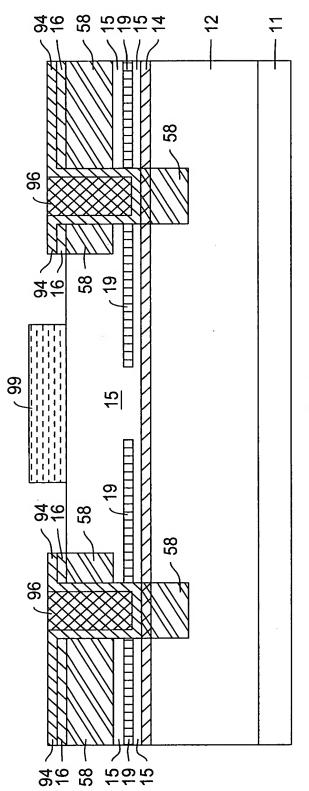
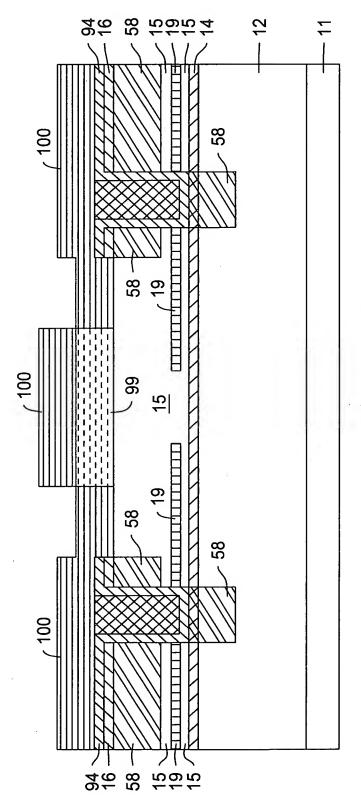


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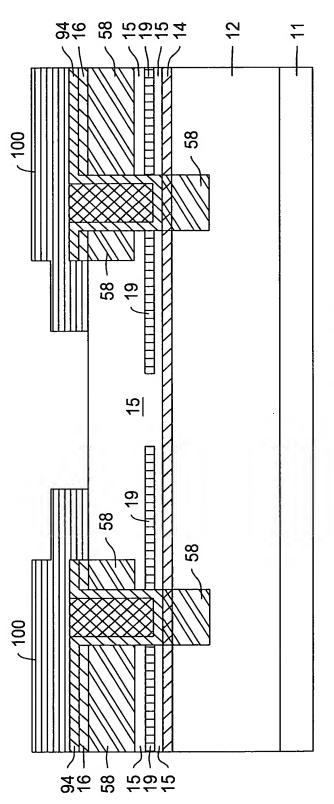
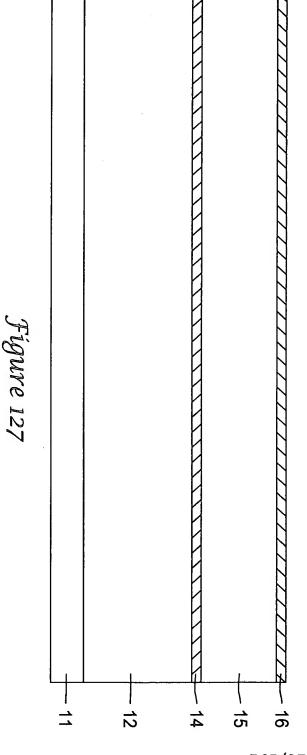


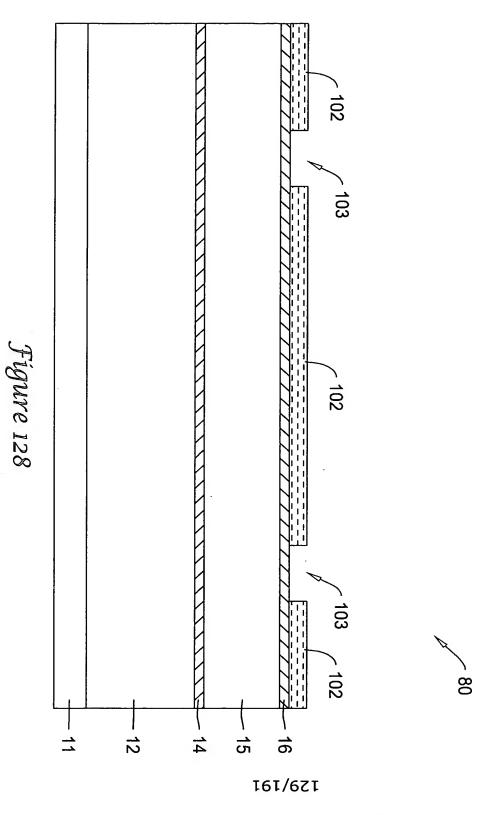
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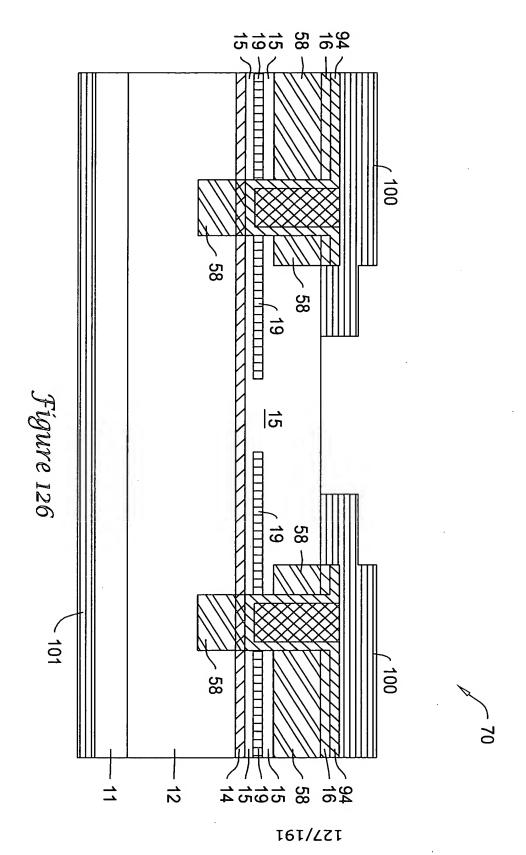
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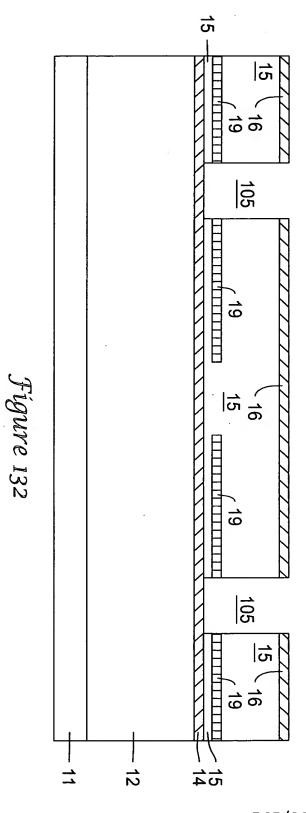
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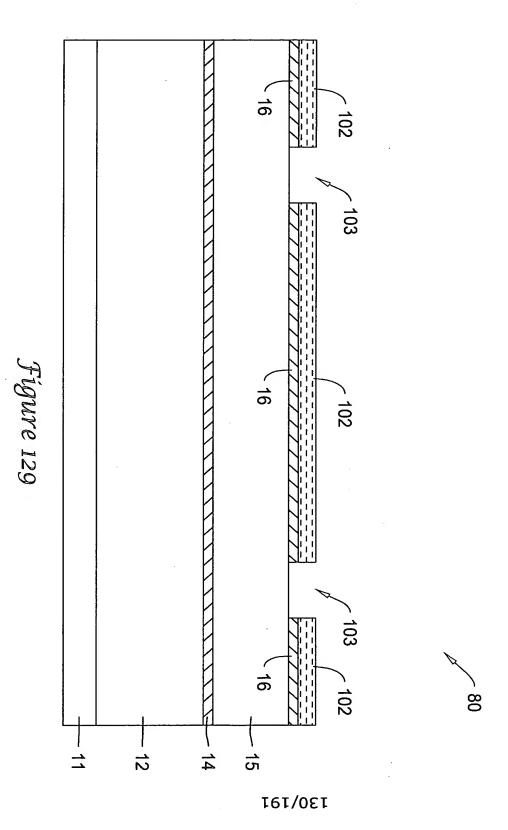
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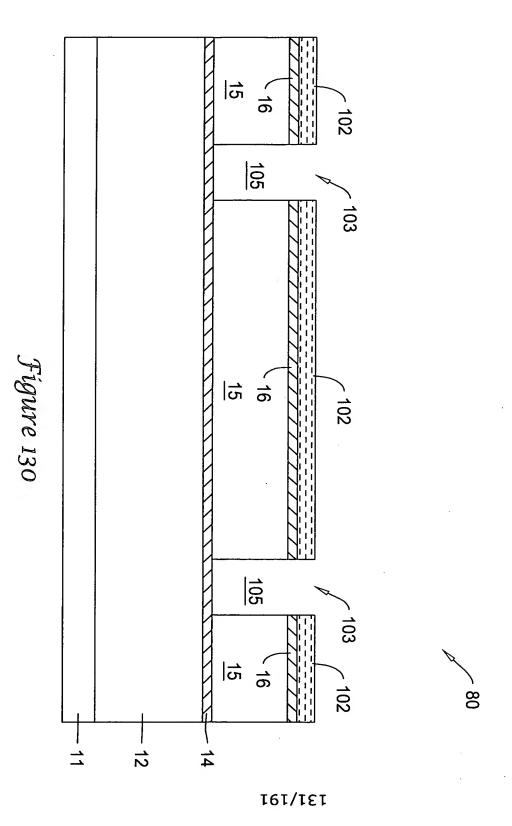
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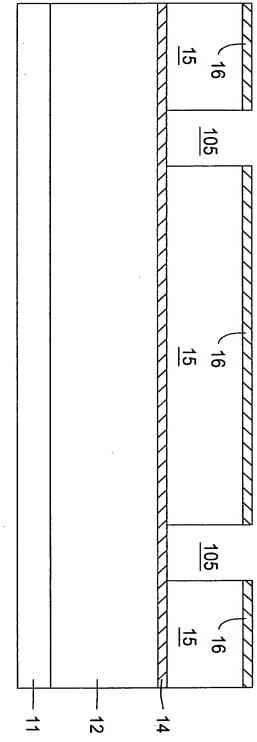


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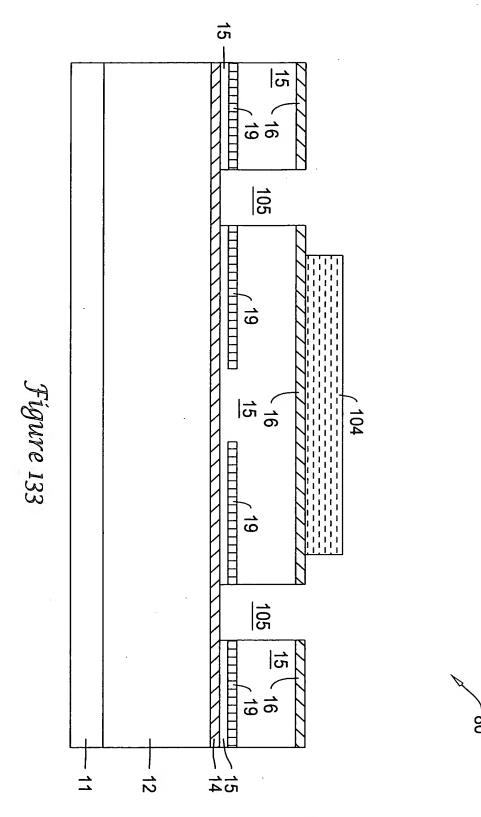
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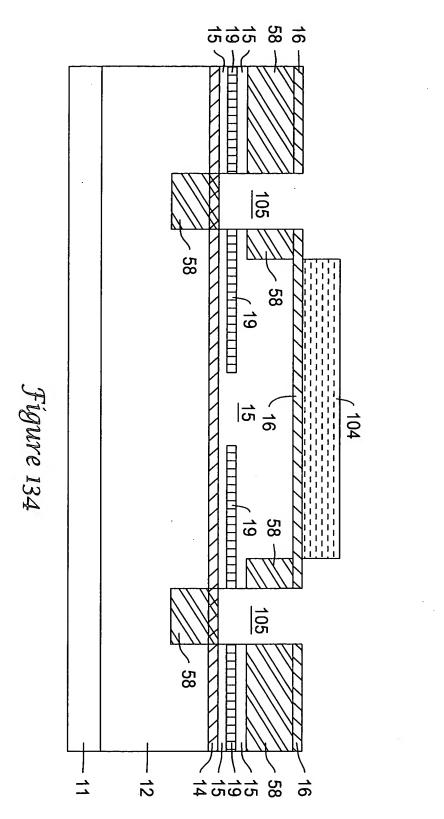
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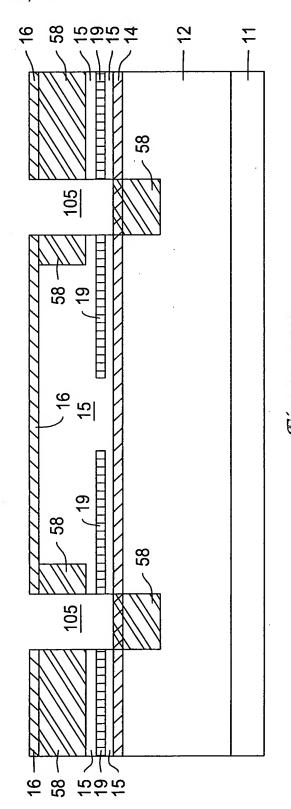
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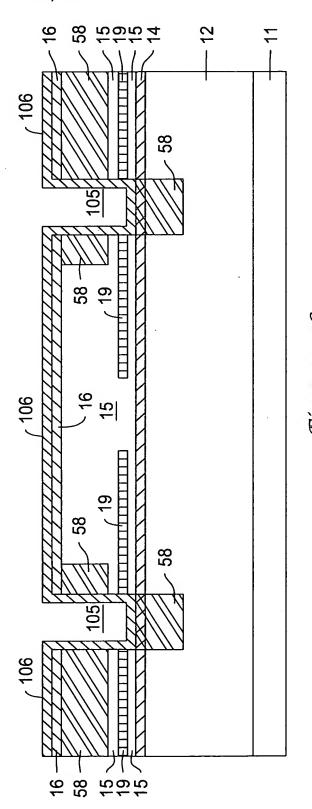
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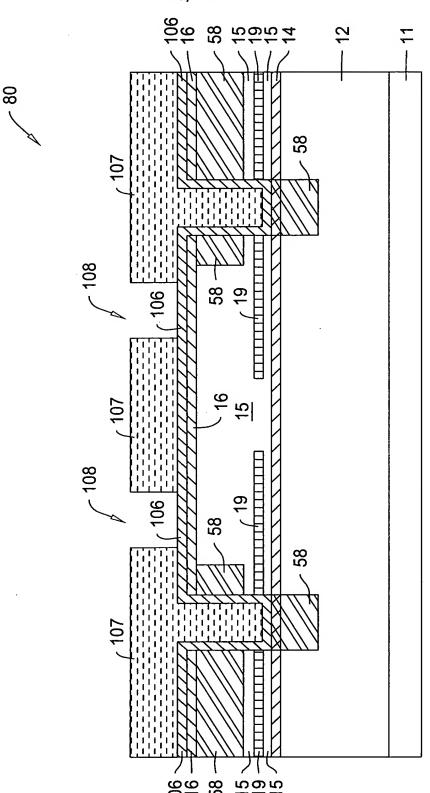


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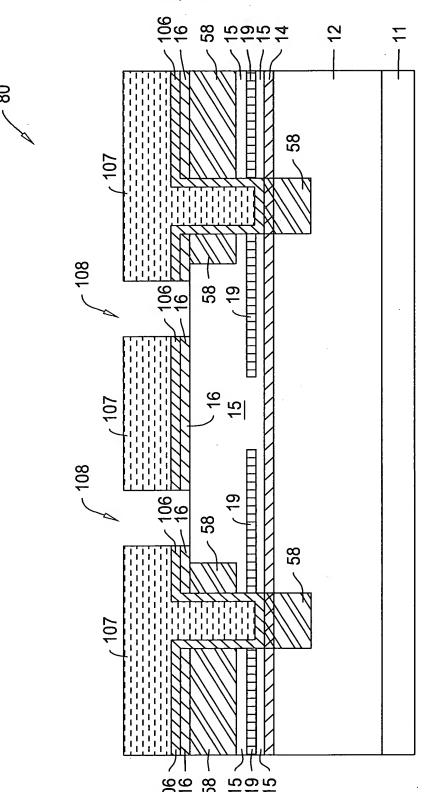


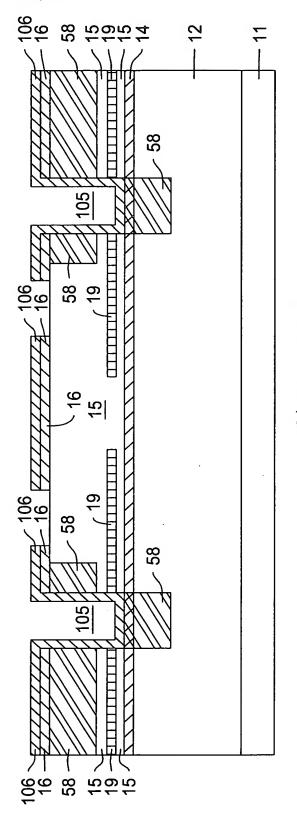
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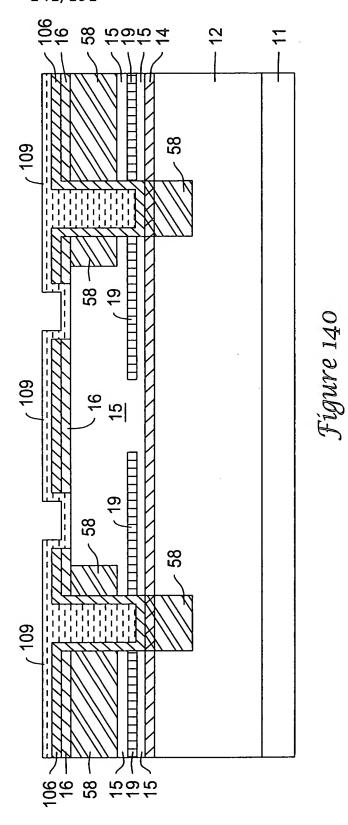
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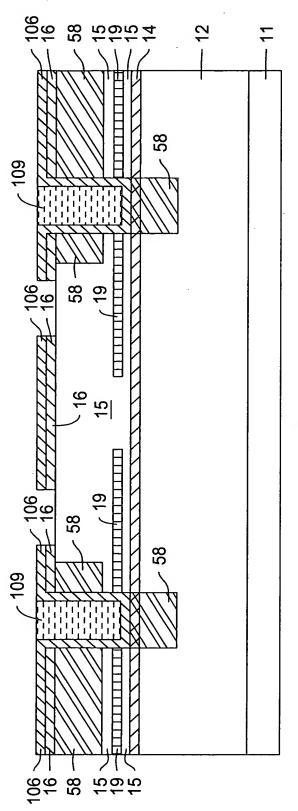
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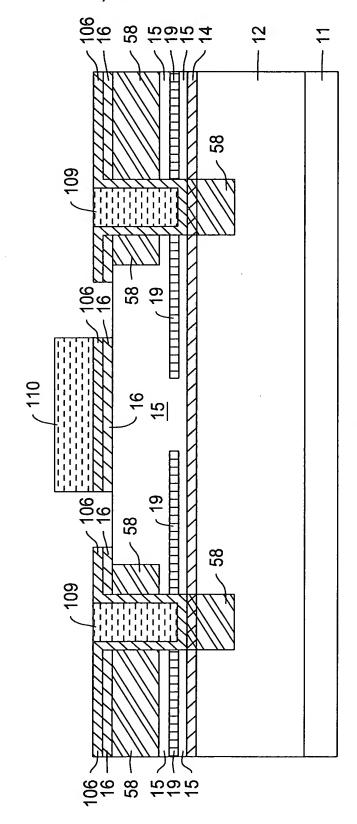


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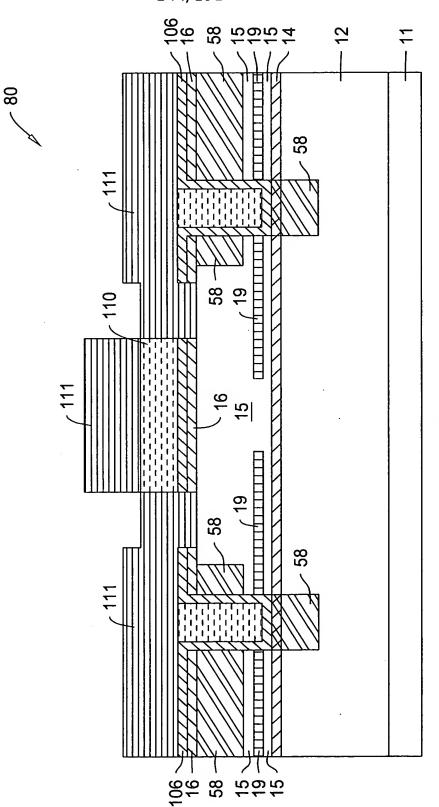


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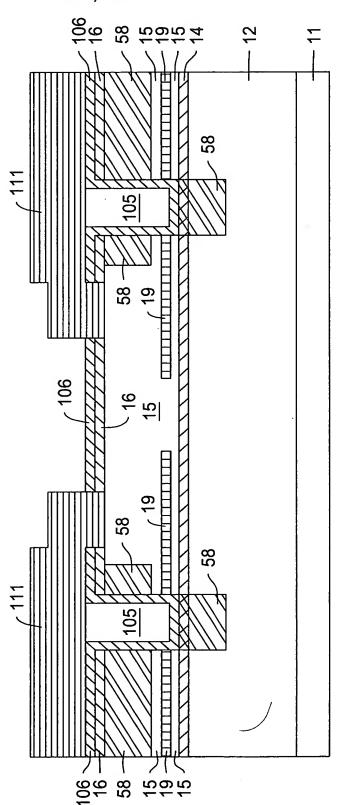
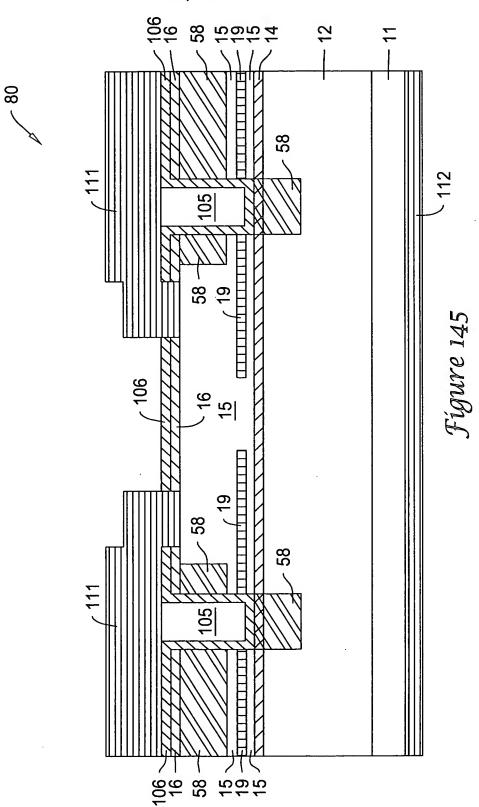


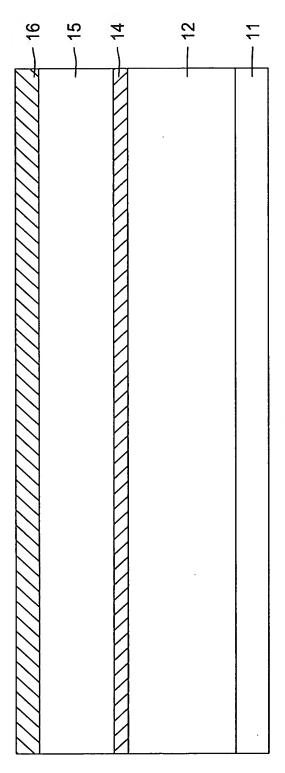
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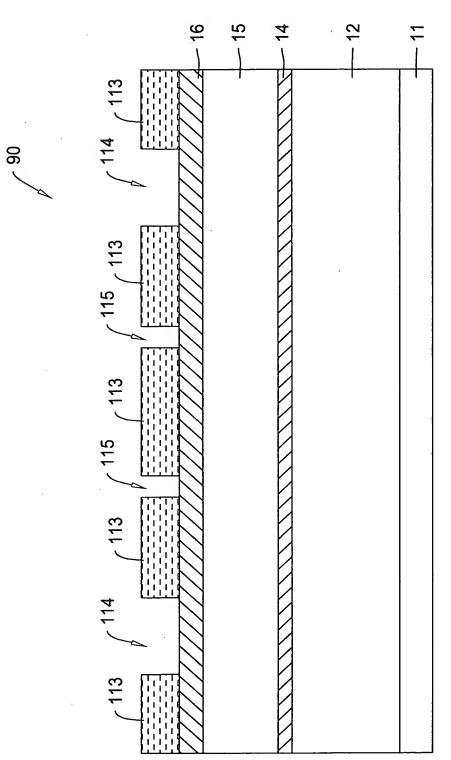


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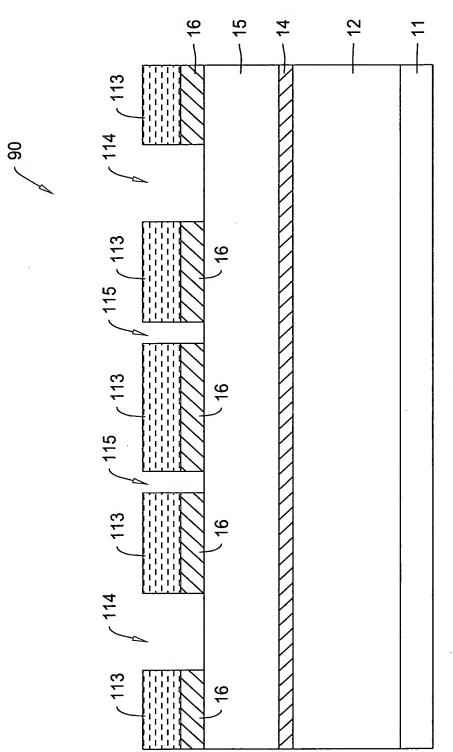


Figure 148

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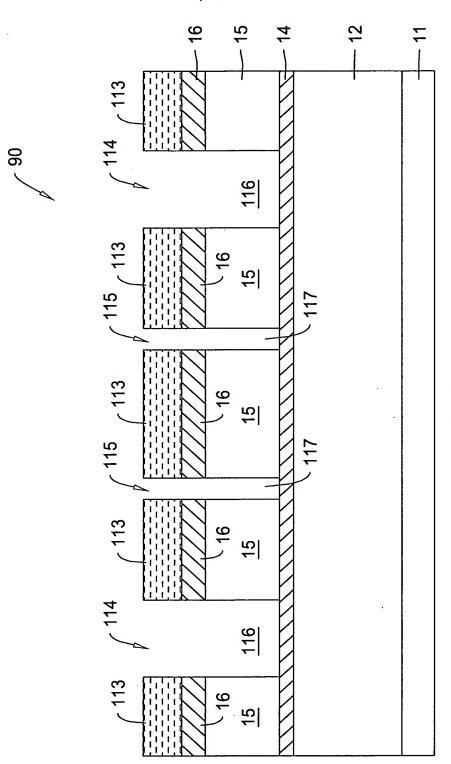
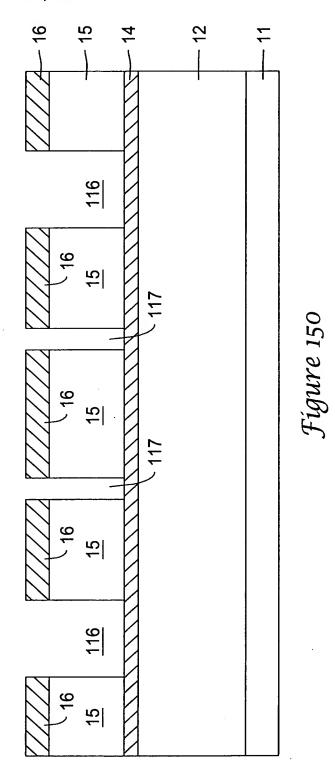


Figure 149

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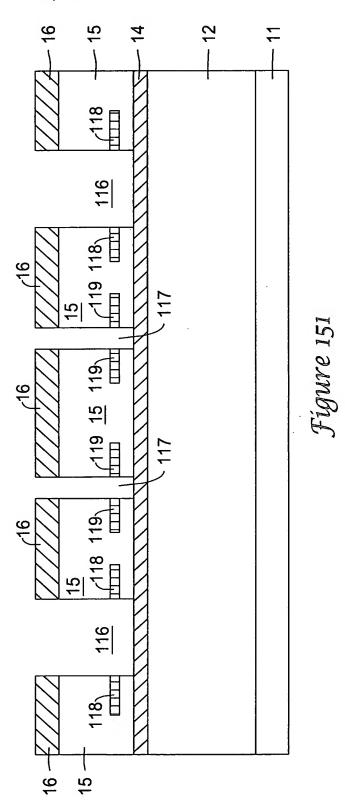
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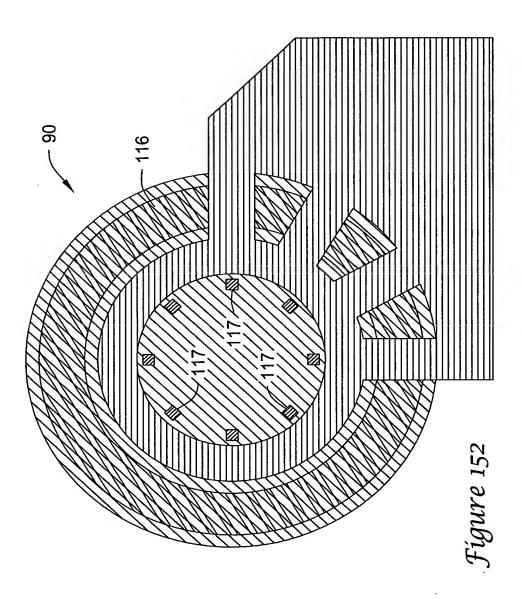
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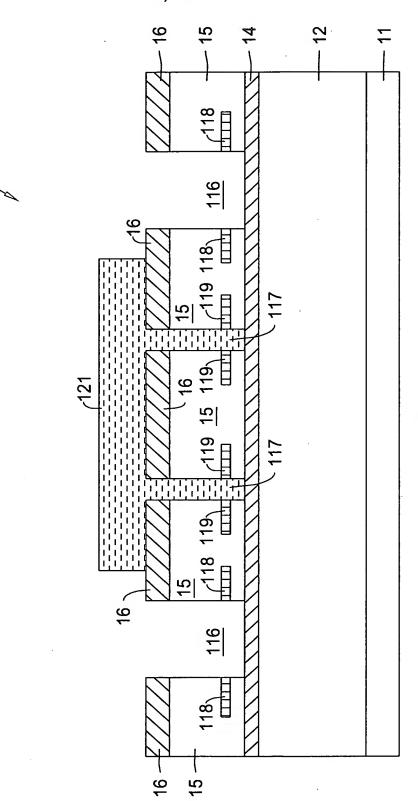


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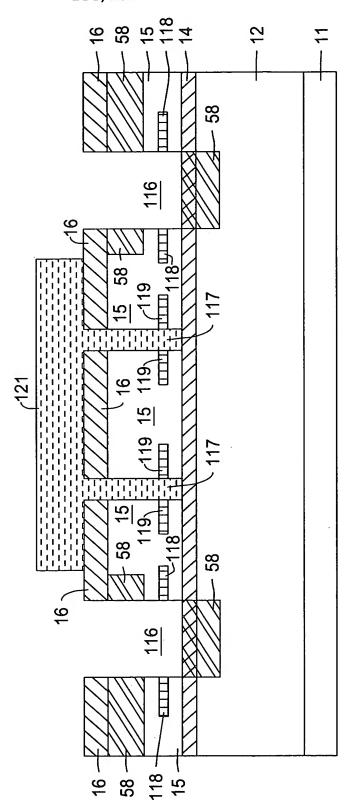
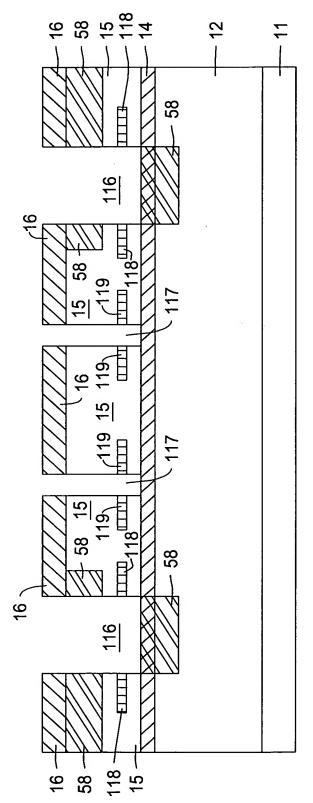


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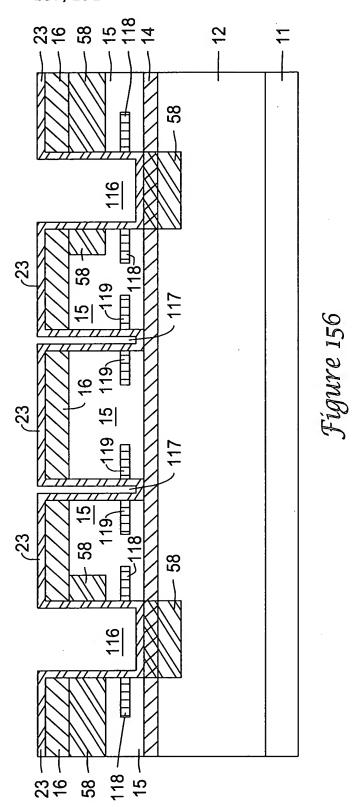
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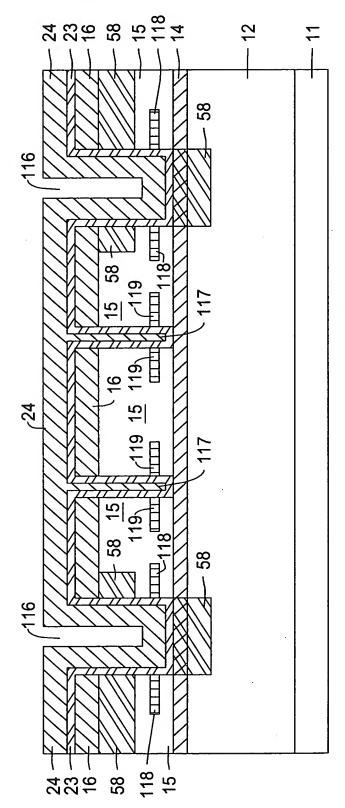


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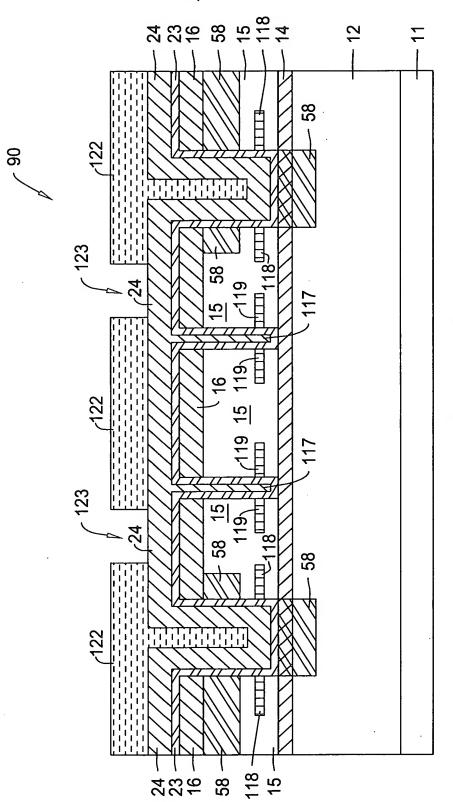


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Figure 157

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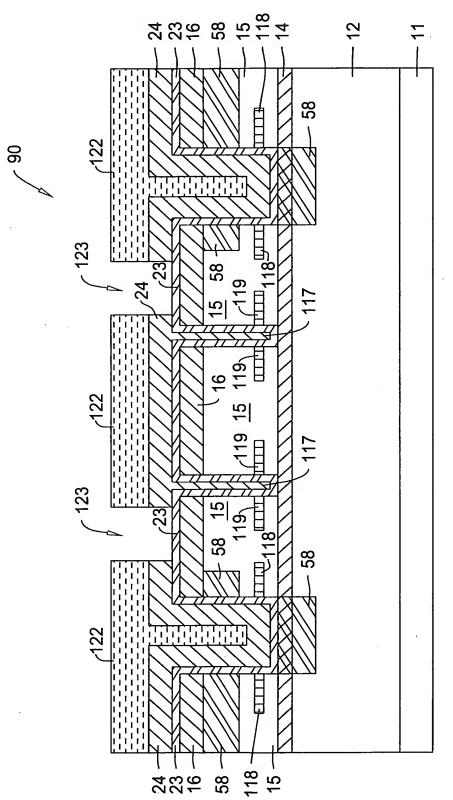
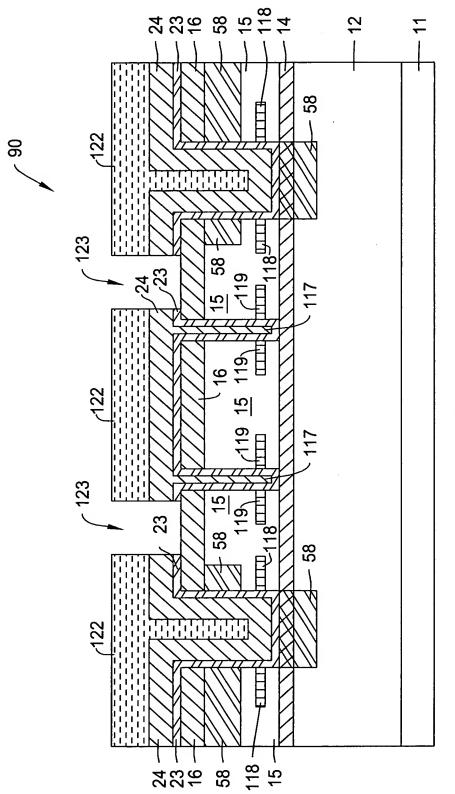


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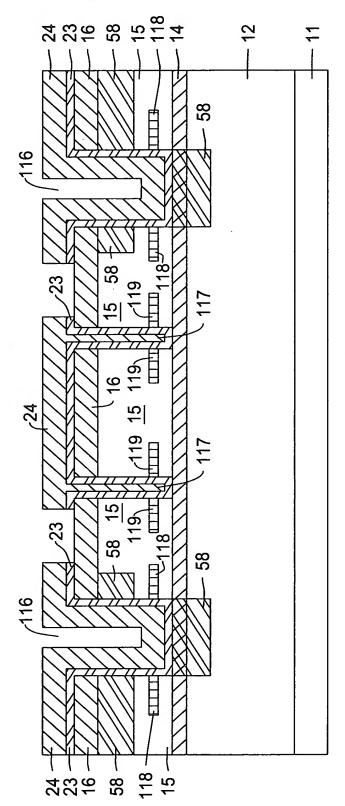
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Fígure 160

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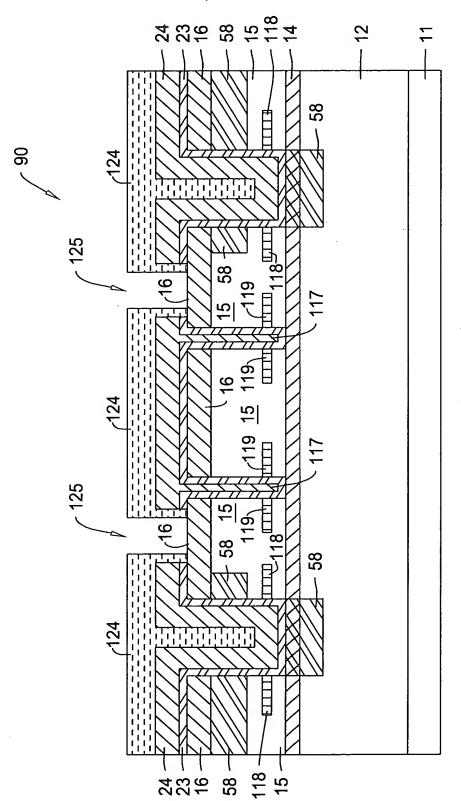
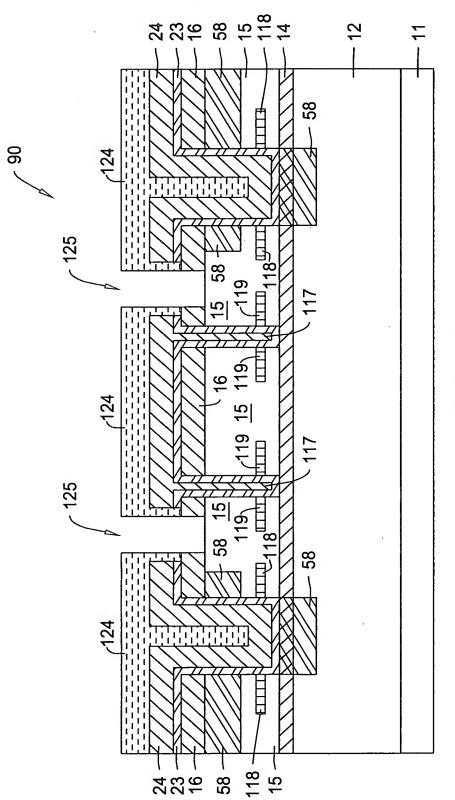


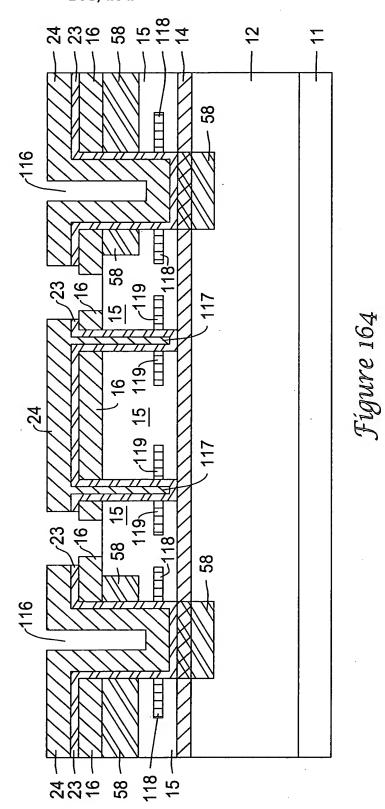
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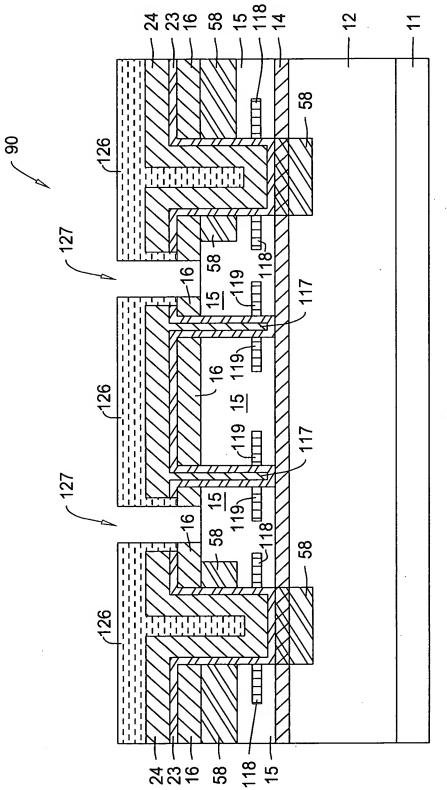
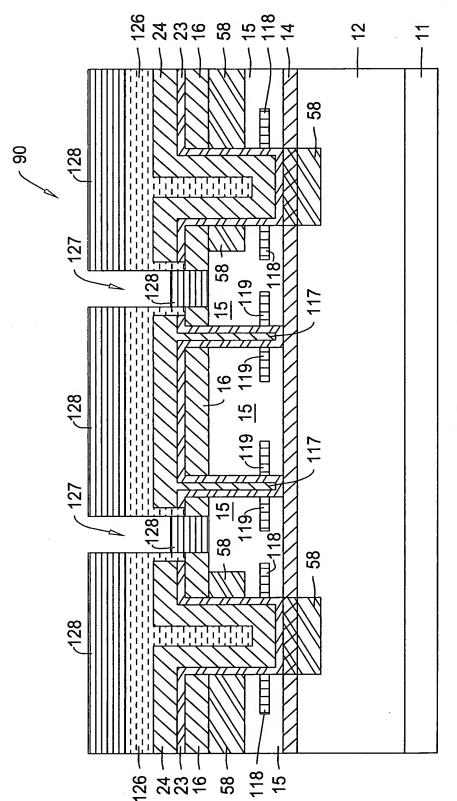


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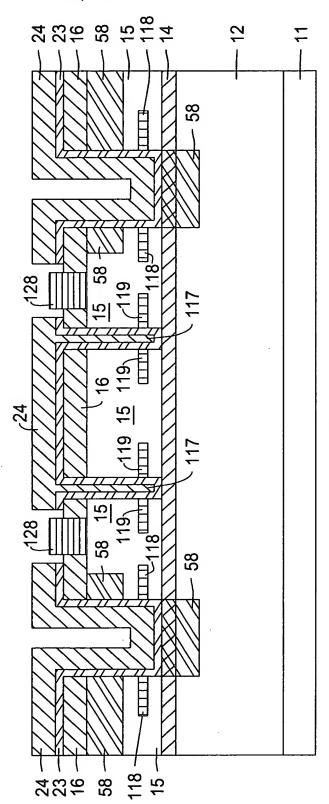
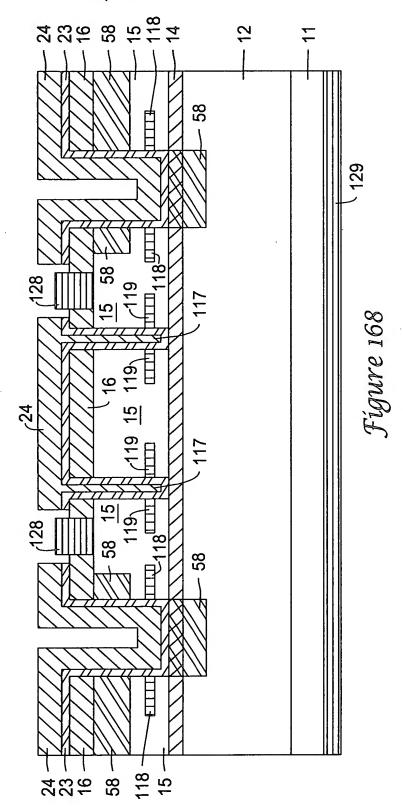


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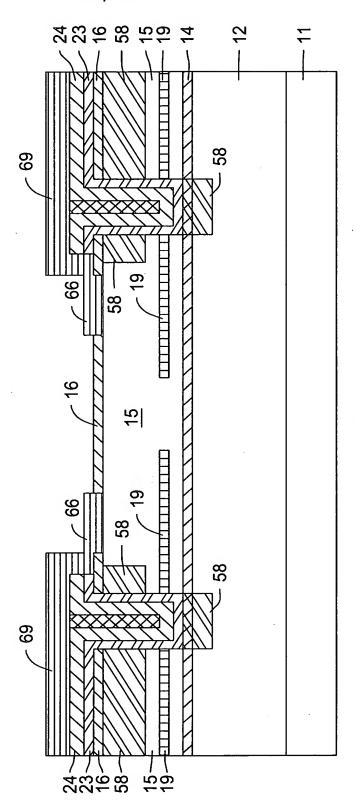
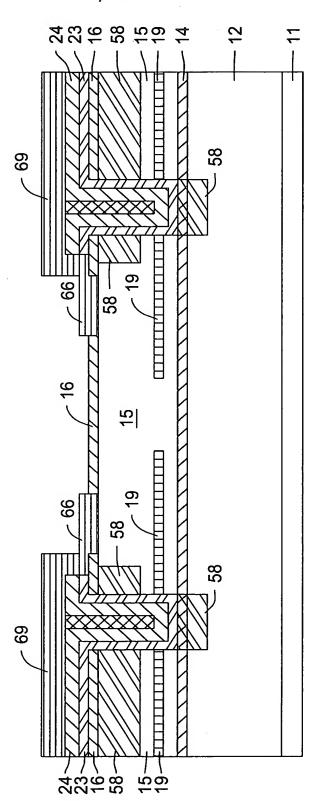


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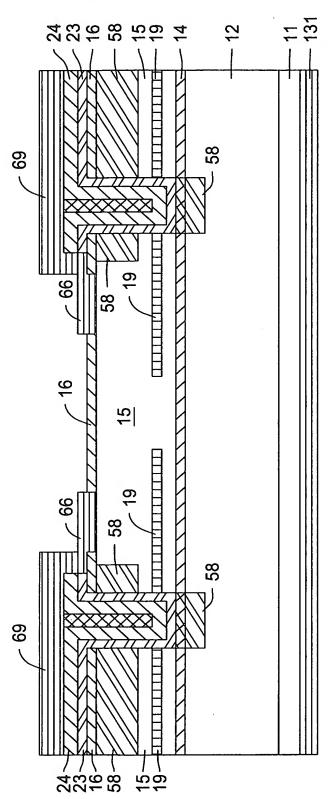
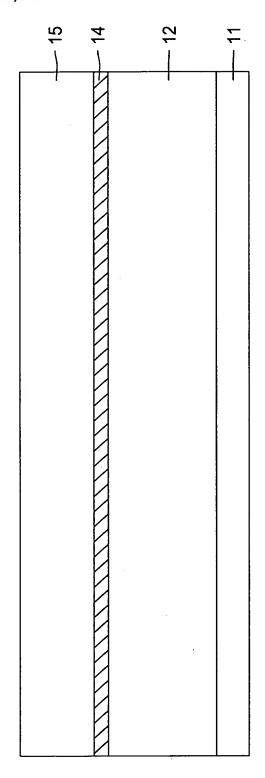


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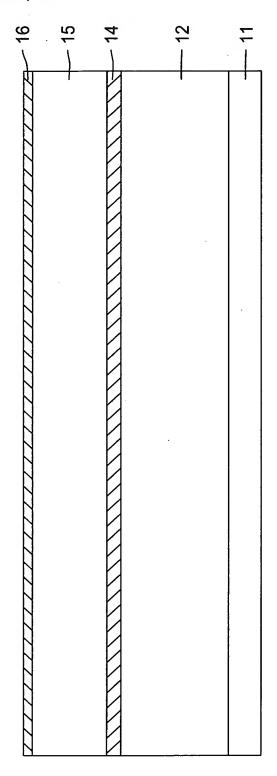
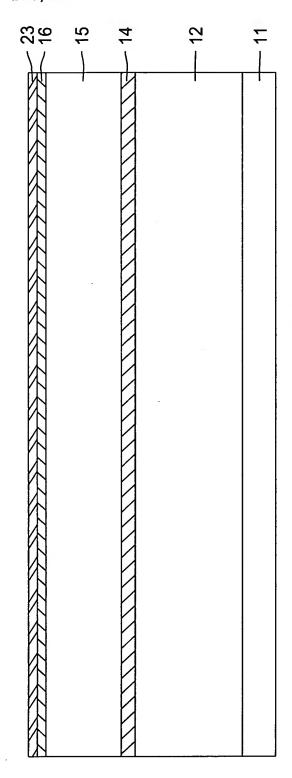


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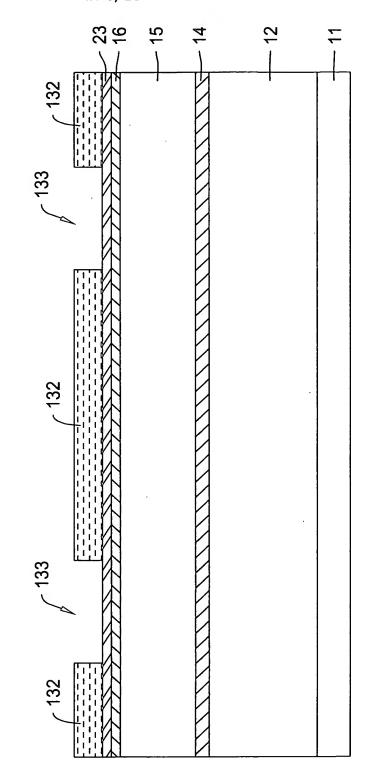


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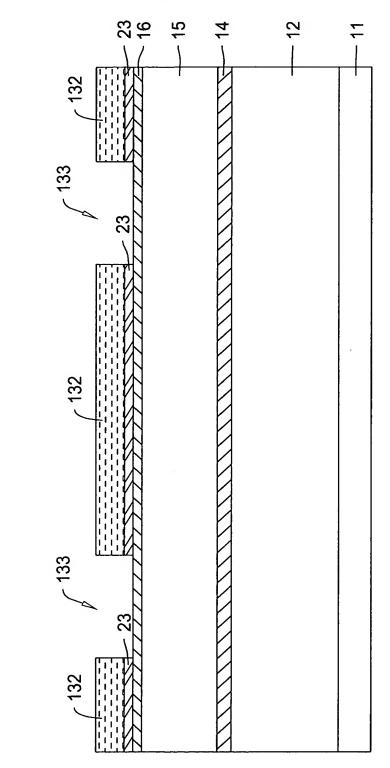
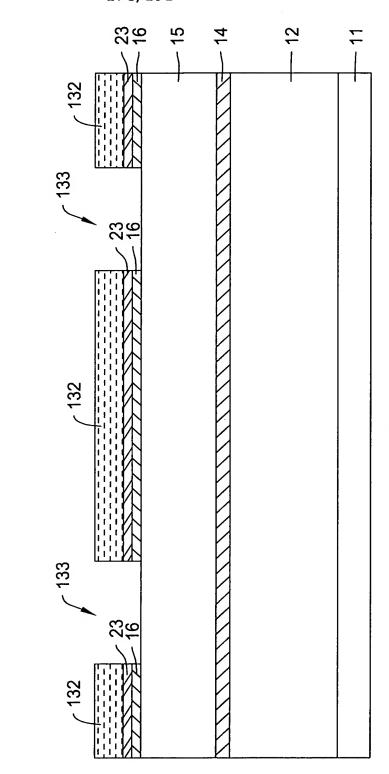
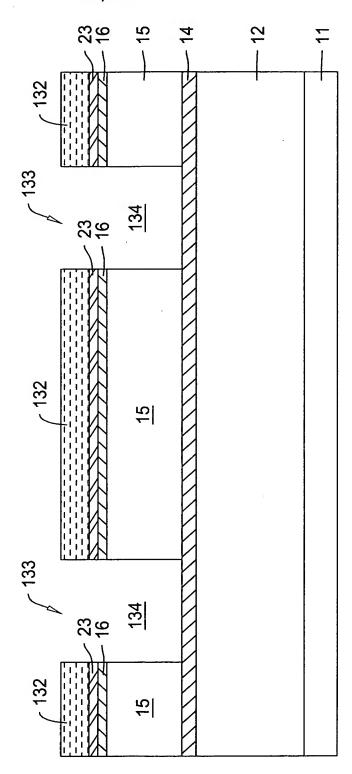


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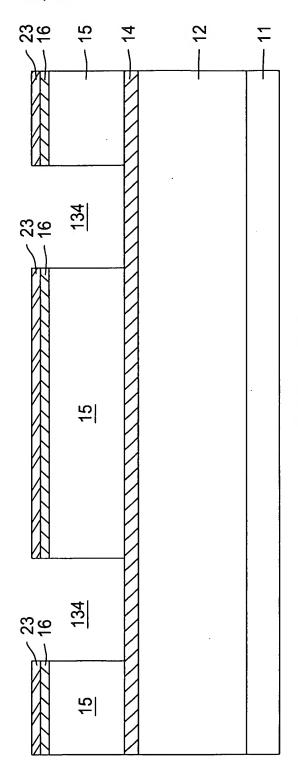
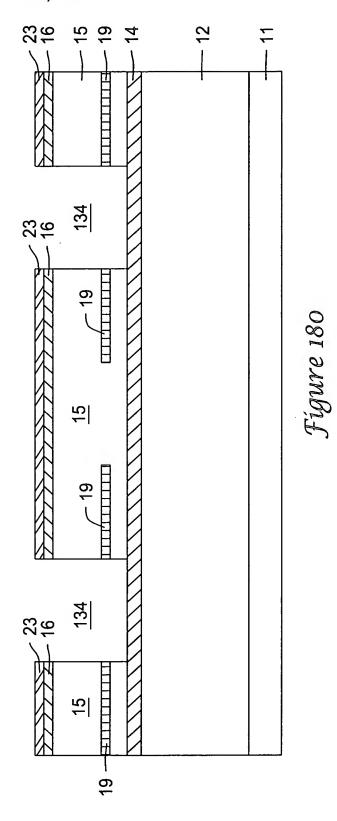
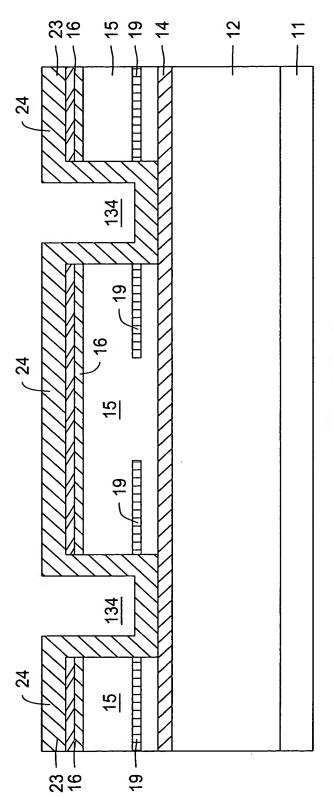


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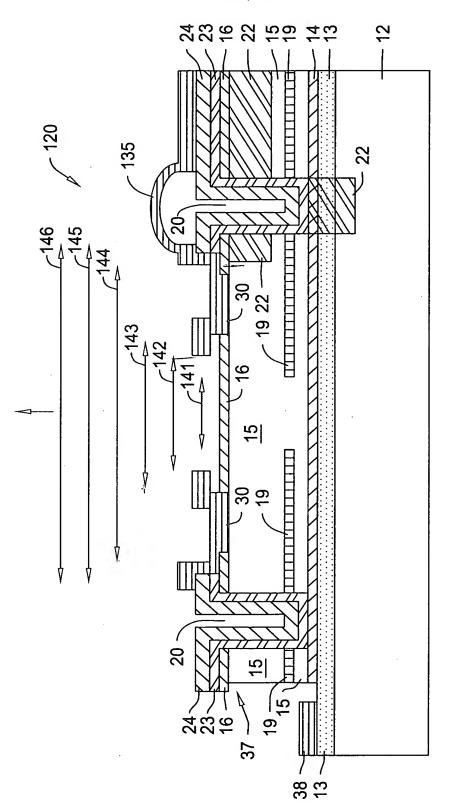
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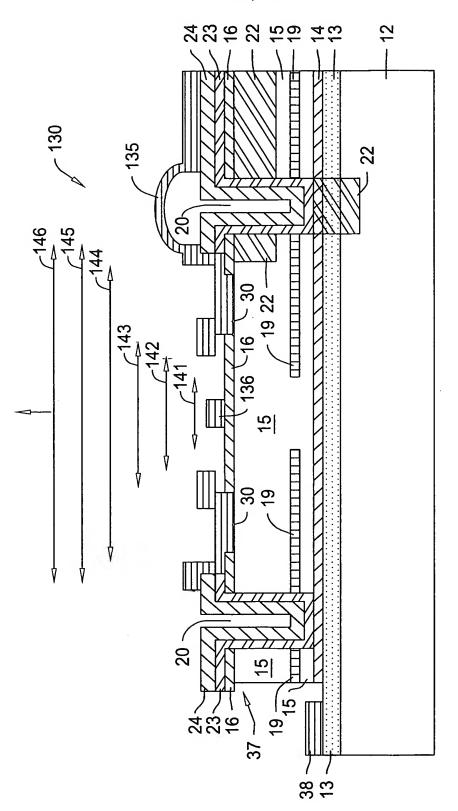
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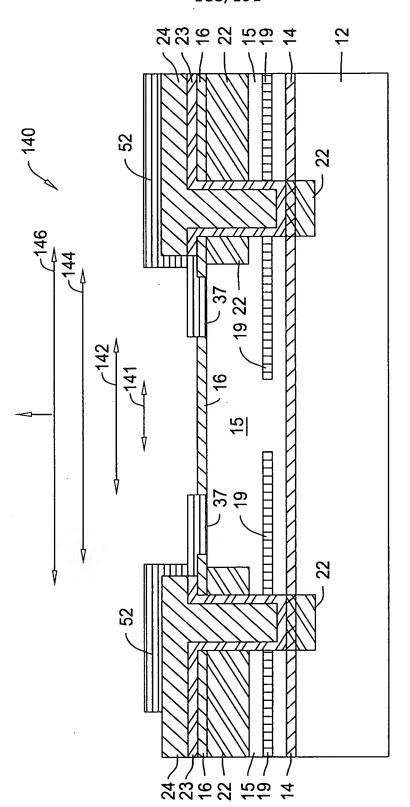


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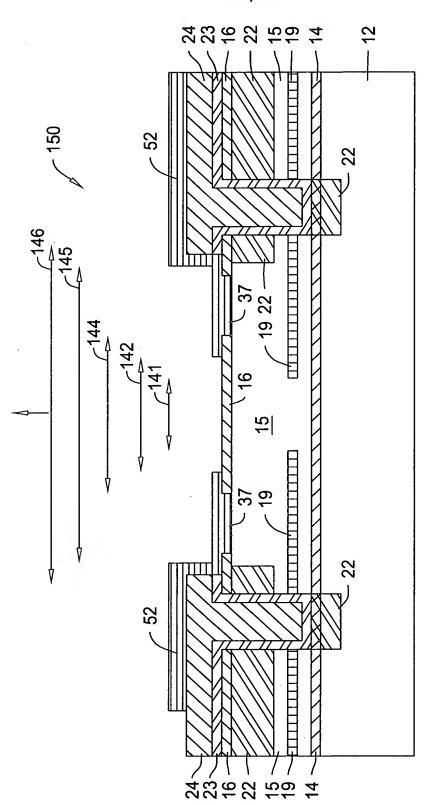
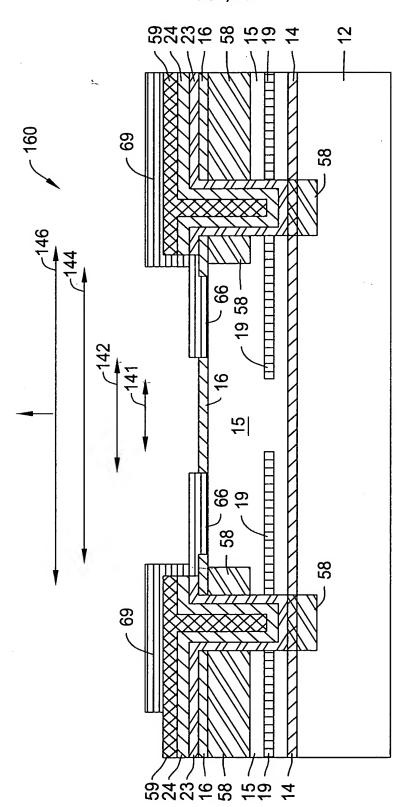


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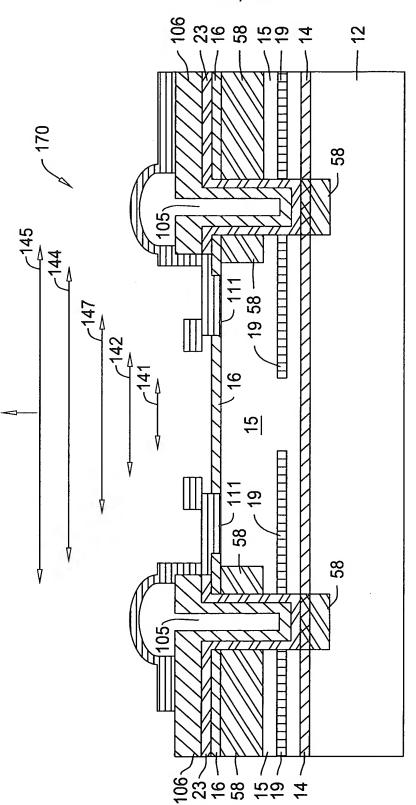
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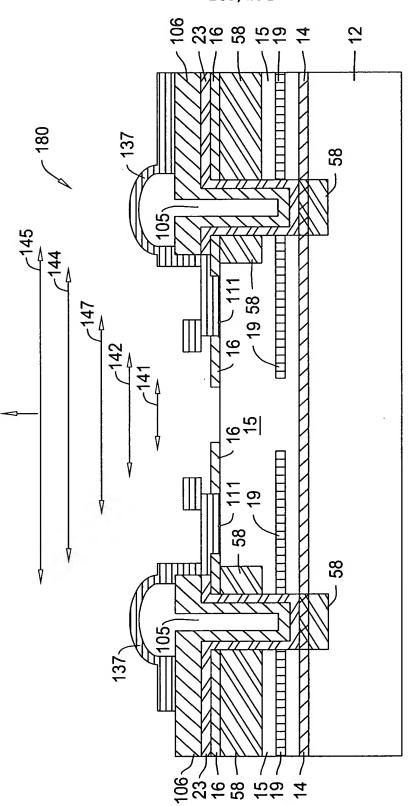
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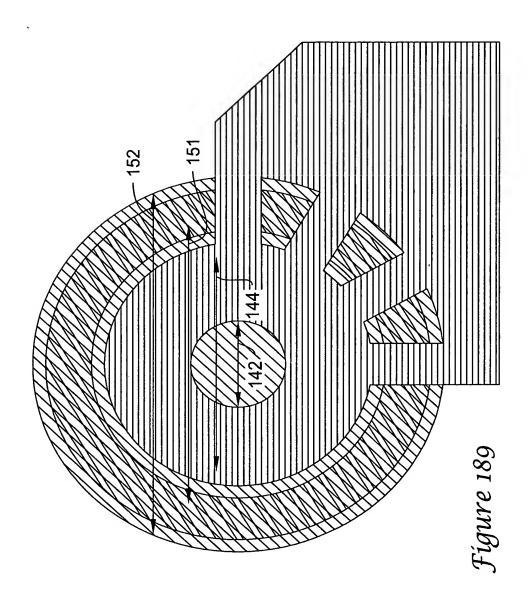


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VCSEL Aperture 10 um lateral oxidation 2.5 um wide trenches 4 um wide trenches Implant isolation Area without thick coating Metal aperture pullback variation Partially covers trench optional? Extends below metal ID Slightly less than aperture via For patternable trench fill-ins	Matched to wide trenches Larger than metal ID Partially covers wide trench 4 um wide outer metal ring Largest diameter: 42 um Set to near edge of die Circle/polygonal pattern in aperture area Circle/polygonal pattern in aperture area
Dimension Notes Variable A+20 B+5 B+8 B-4 A+M A+M B-2 C+3 B-6	B+12 C+4 B+10 B+18 D+8 180 Variable
Variable A B C C C	, , , , , <u>, , , , , , , , , , , , , , </u>
Eeature Oxide Aperture Oxide Trench ID Thin Trench OD Wide Trench OD Isolation Aperture Via Inner Metal ID Inner Metal OD Contact Via ID Contact Via OD	Air Bridge OD AB Aperture D Outer Metal ID Outer Metal OD SA Coplanar ID SA Coplanar OD HOM(Metal) Filter

Standard Layout Geometry

Oxide Aperture Variations (A): 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 um Metal Pullback (diameter) (M): 1, 3, 5 um Higher Order Mode Filter (diameter) (F): .5, 1, 2 um